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***Ontario Hydro Annual Report/1981***

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### FINANCIAL HIGHLIGHTS

	<u>1981</u>	<u>1980</u>
	(in thousands of dollars)	
Revenues	3,161,508	2,819,215
Income Before Extraordinary Item	406,818	376,426
Total Assets	17,829,621	15,593,347
Net Additions to Fixed Assets	2,144,210	1,469,550

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## ONTARIO HYDRO

Head Office, 700 University Avenue, Toronto M5G 1X6

Ontario Hydro is a special statutory corporation providing electricity for municipal utilities, rural customers and a group of large direct industrial customers. It is

financially self-sustaining and provides power at cost. Its bonds, notes and debentures issued to the public are guaranteed by the Province of Ontario.



# REPORT OF THE BOARD OF DIRECTORS OF ONTARIO HYDRO FOR THE YEAR 1981

To:  
The Honourable Robert Welch,  
Minister of Energy

We, the Board of Directors,  
submit to you this report of the  
financial position and relevant  
Ontario Hydro activities for the  
year 1981. We would like to  
thank you and the staff of the  
Ministry of Energy for the co-  
operation and understanding  
extended during the year.

On behalf of the Board

*Hugh L. Macaulay*

Hugh L. Macaulay  
May, 1982

## Macaulay

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Ontario Hydro's senior management team (from left):  
Chairman Hugh Macaulay, President Milan Nastich  
and Executive Vice-Presidents Pat Campbell and Arvo  
Niitenberg on a visit to the Bruce Nuclear Power  
Development near Kincardine.

the normal inflationary pressures on our fuel and  
operation costs. Hydro will be placing in service  
large, high capital cost generating stations as well as  
major new transmission facilities. In addition, we  
are experiencing record-high interest rates and a  
weak Canadian dollar. Both add to the cost of the  
money we borrow in Canada and foreign countries  
to pay for these new projects. Part of Hydro's capital  
expenditures over the next few years are necessary  
to meet the Ontario government's objective of an  
economic system for the 1980s based increasingly on  
electrical power and nuclear technology. Our cur-  
rently committed generation expansion program will  
cost an estimated \$21 billion. About 90 per cent of  
this will be spent on construction of the Darlington  
nuclear station and completion of the Pickering B  
and Bruce B nuclear facilities. Nuclear stations have  
significantly lower fuelling costs. For example, in  
1981 the cost of nuclear fuel to generate one  
kilowatt-hour of electricity was only one-tenth of the  
cost of the coal needed to make the same amount of  
energy. The introduction of this additional nuclear-  
generated power into our system will markedly  
reduce the need for more costly coal purchases and,  
as an added bonus, will reduce the acid gas emissions  
from our coal-fired stations. All this will mean, we  
believe, more stable rates in the mid-1980s, when we  
more fully realize the nuclear advantage.

**Q. Economic issues aside, what do you  
consider the biggest problem facing Ontario  
Hydro?**

A. I guess it would be obtaining approval for trans-  
mission lines or getting the power to where our  
customers are. Especially in the southwestern and  
the eastern sections of Ontario. In both areas our  
transmission systems are operating near capacity. In  
the east we must improve the system to meet the



## FINANCIAL HIGHLIGHTS

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financially self-sufficient, issuing bonds, notes and debentures guaranteed by the Government of Ontario.



# An interview with Hugh Macaulay

**Q. Hydro appears to be a major instrument in the government's determination to stimulate the provincial economy. Can you comment on this?**

A. The Ontario government has called Hydro's power system a cornerstone of the provincial economy, and said that the continued vitality and development of that system is essential to sustaining Ontario's economic growth. That kind of thinking, coupled with a new awareness of the value of indigenous energy resources and the need to end our dependence on fossil fuels, has resulted in new approaches to planning at Ontario Hydro. Instead of working merely to meet anticipated demand, we are now looking at a wider role for Ontario Hydro, and considering the effects our large construction projects, our exports, our rates, and in fact all our activities can have on the social, environmental and economic life of the province. That's one reason why we're going ahead with new hydro-electric projects and completing the nuclear ones we've started while we're in a period of surplus generation. But it's not the only reason.

Ontario's demand for electricity is growing annually at an average of three per cent, and it takes 10 to 15 years to bring new generating plants on stream. We're looking a long way down the road. A lot of things can change. We've got to be ready for anything that comes along.

The challenge that faces us is to play an increasing role in the life of the province while continuing to provide electricity to our customers in an efficient, reliable, and affordable way.

**Q. For the first time in several years, Hydro's proposed rate increase for 1983 is higher than the predicted inflation rate. Does this foretell even larger rate hikes in future years?**

A. In real terms, the price of electricity to consumers in Ontario has declined since 1978. That is, our annual rate increases in the period 1978 to 1981 have averaged one per cent below the forecast rate of inflation. And the 1982 rate was below the forecast rate for this year. The rate proposal submitted to the Ontario Energy Board for 1983 averages 13 per cent for municipal utilities and 14.8 per cent for direct industrial customers. With 1983 inflation forecast at 12.5 per cent, we're going to be slightly over inflation. But we are facing some extraordinary expenses over the next few years above and beyond



*Ontario Hydro's senior management team (from left): Chairman Hugh Macaulay, President Milan Nastich and Executive Vice-Presidents Pat Campbell and Arvo Niitenberg on a visit to the Bruce Nuclear Power Development near Kincardine.*

the normal inflationary pressures on our fuel and operation costs. Hydro will be placing in service large, high capital cost generating stations as well as major new transmission facilities. In addition, we are experiencing record-high interest rates and a weak Canadian dollar. Both add to the cost of the money we borrow in Canada and foreign countries to pay for these new projects. Part of Hydro's capital expenditures over the next few years are necessary to meet the Ontario government's objective of an economic system for the 1980s based increasingly on electrical power and nuclear technology. Our currently committed generation expansion program will cost an estimated \$21 billion. About 90 per cent of this will be spent on construction of the Darlington nuclear station and completion of the Pickering B and Bruce B nuclear facilities. Nuclear stations have significantly lower fuelling costs. For example, in 1981 the cost of nuclear fuel to generate one kilowatt-hour of electricity was only one-tenth of the cost of the coal needed to make the same amount of energy. The introduction of this additional nuclear-generated power into our system will markedly reduce the need for more costly coal purchases and, as an added bonus, will reduce the acid gas emissions from our coal-fired stations. All this will mean, we believe, more stable rates in the mid-1980s, when we more fully realize the nuclear advantage.

**Q. Economic issues aside, what do you consider the biggest problem facing Ontario Hydro?**

A. I guess it would be obtaining approval for transmission lines or getting the power to where our customers are. Especially in the southwestern and the eastern sections of Ontario. In both areas our transmission systems are operating near capacity. In the east we must improve the system to meet the





growing demands of the Ottawa area and increase the capacity of interconnections with Hydro-Quebec. In the west similar growth demands have to be met. There is also a critical need to get the cheaper nuclear-generated energy from the plants near Port Elgin into the Hydro system. The sooner we get lines out of Bruce, the sooner we save millions of dollars from burning coal, with its accompanying pollution problems. Proposals for both the east and southwest systems have undergone intensive and costly public participation studies, and Hydro has identified preferred plans for both systems. These plans have been presented at public hearings under the new Consolidated Hearings Act — a process designed to speed up the old multi-tiered system. Following approval of these system plans, the actual route selection process begins. It still takes time, but in the long run it serves the best interests of our customers and the province.

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***Q. What about acid rain? Hydro is Ontario's second-largest contributor. Don't you have to set an example in cutting down on emissions?***

A. That's exactly what we're doing. As we announced early in 1981, in concert with the Ministry of the Environment, Hydro is undertaking a \$600 million, 10-year program to cut acid gas emissions from our coal stations by about 50 per cent between 1982 and 1990. We'll do that despite the fact that demand for electricity will be going up by 32 per cent in the same period — and we'll maintain current levels of exports in the bargain. Hydro is responsible for two to four per cent of the acid rain that falls on sensitive areas in Ontario. Cutting that contribution in half won't in itself do much to solve the overall problem of acid rain in Ontario — after all, about two-thirds of it blows across the border from the USA — but as a public company Hydro has a responsibility to take exemplary and definite measures to deal with acid rain. On behalf of electricity customers in Ontario, that's what our program provides.

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***Q. Fair enough. But Hydro is planning major export sales of electricity to the United States, much of which will be coal-fired. Don't those sales run counter to Hydro's acid gas reduction program?***

A. No. With or without any export sales, we're going to cut emissions in half by 1990 — that's what the law says we have to do. Of course, we're very interested

in exporting electricity. Our current surplus capacity makes that extremely attractive. It's important to remember that we're currently exporting about 11 billion kilowatt-hours of electricity a year; in 1990, we hope to increase that amount slightly, while having reduced our acid gas emissions by 50 per cent. Both federal and provincial governments have supported the concept of exports of power — because electricity is a manufactured product, and like any manufactured good, its international sale helps Canada's balance of payments deficit. And in 1981, exports of electricity meant that everybody's Hydro bills in Ontario were 6.5 per cent lower than they would have been without exports.

Lower electricity rates in Ontario attract jobs and industry to the province. So export sales are an important part of Hydro's business. When they can exist along with a dramatic reduction in acid gas emissions, they are definitely in the best interests of Ontario and Canada.

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***Q. Do recent amendments to the Power Corporation Act indicate Hydro is evolving from its traditional position as an electric utility into an energy company?***

A. In the past few years, the by-products of electrical generation, such as steam and hot water, have been recognized as having valuable commercial application. Steam from our Bruce nuclear plant is a case in point. Amendments to the Power Corporation Act in 1981 allow Hydro to sell steam to a marketing agency which in turn will sell it to interested industrial firms and greenhouse operators. In fact, Hydro has a number of current or potential products besides electricity, such as hydrogen, oxygen, heavy water, and tritium. Warm discharge water from our thermal and nuclear plants could also lead to fish and shrimp farms, and the production of methane. Wherever the industrial process of making electricity can help to save other energies, we'll be looking at possible projects — as long as the electricity buyer in Ontario doesn't have to subsidize them.

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***Q. Hydro is one of the utilities most involved with nuclear energy in North America. What's your reading of current public attitudes towards nuclear in Ontario?***

A. Public attitude research tells us different things, generally depending on how the questions are asked. Hydro's nuclear energy program enjoys the support of the Ontario government, so obviously that's one important test of public opinion. I think most people in Ontario accept the need for nuclear energy in this province. And it's an established fact of life. Almost 35 per cent of the power we made in 1981 came from nuclear plants. Ontario Hydro's excellent safety record, and the fact that we took seven of the top 10 places in world reactor performance in 1981, make it easy to argue the advantages to Ontario of nuclear energy. Facts tend to speak for themselves.



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***Q. Does all this apparent thrust toward additional generating capacity suggest Hydro is moving away from its conservation program?***

A. Definitely not. In fact, you can say that the cheapest and most helpful form of new generation is the kilowatt we save by conservation. We have a vigorous conservation program in place. Our message to the public is use electricity wisely, and save it wherever possible. Elsewhere in this report Hydro's President comments on new incentives designed to promote effective and efficient use of electricity. These are the kinds of activities in which people want Hydro to show leadership. Heating homes with electricity will become increasingly attractive compared with heating with gas or oil, and we have an obligation to give people the facts they want to know about the alternatives.

That's why we launched the Residential Energy Advisory Program (REAP) in September of 1981. This program, now available to our rural customers and soon to be extended to the municipal utilities, gives householders free advice from energy experts on the most efficient and economical heating systems applicable to their home. We also have energy use and load management programs underway, and are involved in the Ministry of Energy's solar and heat pump programs. Anything that helps save any kind of energy — including electricity — is of interest to us.

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***Q. Your projected capital expenditures will be substantial over the next few years. What effect will this have on Hydro's financing program and on the corporation's financial soundness?***

A. Increased capital expenditures mean that Ontario Hydro will have to borrow more than in recent years. We feel that the amount of capital required can be raised. While capital markets have become more volatile, Hydro has access to a wide range of financing options. The challenge for Ontario Hydro, given the high uncertainty in capital markets, is to find the right mix of financing. We don't want all our financing to be locked into today's high interest rates for the next 20 to 30 years. So I foresee an increased use of shorter term debt and other financing sources to help reduce interest costs. This is also the likely direction in which the capital markets are heading. Hydro's approach is to keep ahead of the times and is not just a result of our increased capital expenditures.

The increased level of borrowing over the next few years will slow down progress toward the achievement of our desired level of financial soundness. We plan to continue raising some of the required funds through revenues. We have taken a look at our financial picture in the medium term and are confident that an acceptable level of financial

soundness can be maintained without undue upward pressure on rates.

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***Q. In 1981, you accepted a second term as Chairman of the Board. Can you summarize your impressions of your first term?***

A. They've been eventful years — to say the least. If I had to think of a catch phrase to describe what I've seen happen at Hydro over the past three years, it would be consciousness-raising. I think Hydro is much more aware of the role it plays in the social, economic, and political life of Canada. We've made considerable progress toward our goal of improving communications with the public and our employees. I'm continually impressed by the technical reputation Ontario Hydro has around the world, and I'm confident that will continue. As we become more aware of our place in the environment — both natural and man-made — I think we'll continue to improve our service to our customers and the province as a whole. An early impression of the dedication and capability of Hydro staff has remained with me over the years. The co-operation and understanding I have received — even when the issues were thorny ones — from our partners in the Ontario Municipal Electric Association, the Association of Municipal Electrical Utilities, and from the Ministry of Energy and members of the Ontario Legislature have made my job more enjoyable. And the support of Hydro Presidents Milan Nastich and Doug Gordon, along with help from Hydro employees at all levels, has been invaluable.

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***Q. Do the four changes on the Hydro Board of Directors in 1981 in anyway change the unique nature of your Board?***

A. When Hydro changed from a commission to a special statutory corporation in 1974, it was decided the Board of Directors — appointed by the Premier — would represent almost every segment of Ontario's population. Board changes during 1981 maintained this unique representation. Retired during the year were four members of the original Board: William Dodge, former Secretary-Treasurer, Canadian Labour Congress; Allen T. Lambert, former Chairman and Chief Executive Officer, The Toronto-Dominion Bank; J. Dean Muncaster, President and Chief Executive Officer, Canadian Tire Corporation Limited; and Robert J. Uffen, Professor, Department of Geological Sciences, Queen's University. Appointed during 1981 were: J. A. Gordon Bell, President and Chief Operating Officer, Bank of Nova Scotia; Albert G. Hearn, former Vice-President, Service Employees International Union; O. John C. Runnalls, Professor of Energy Studies, University of Toronto; and Leonard N. Savoie, President and Chief Executive Officer, Algoma Central Railway.



## ***Hydro given expanded role in Ontario's economy***



*Ontario Hydro President Milan Nastich*

IN 1981, ONTARIO HYDRO celebrated its 75th anniversary — three-quarters of a century of growth, stability and unique technical achievement.

But it was also a year when Ontario, like the rest of the world, faced harsh economic challenges and realities. Interest and inflation rates soared, triggering a drop in capital and consumer spending and a general decline in economic growth.

High energy costs were a major factor in this economic downturn, especially as they applied to the price of oil, gas and coal. Ontario Hydro was not and is not insulated from these realities. In 1981, for instance, our fuel costs alone increased by \$89 million — the bulk of which was toward increased costs of coal.

Early in 1981, the Ontario government took aim at this economic situation and announced a major

industrial expansion program that gave Hydro a key role in contributing to the future development of the provincial economy.

Among other things, the government program looked to an economic structure for Ontario in the 1980s based increasingly on electric power and nuclear technology. And it saw this electrical power coming mainly from fuel sources indigenous to Ontario — uranium and water power.

The government program included an acceleration of construction at the Darlington nuclear station, and of our transmission and distribution upgrading programs. Measures were also included to encourage homeowners to convert from oil to electric heating and — further down the road — the electrification of provincial transit systems.

Ontario Hydro is responding to these initiatives. Darlington's first two units are being advanced six months, and the second two by 12 months. The public participation process is proceeding toward approval of expansion of the southwestern and eastern transmission systems. An increase in hydro-electric capacity in the north-central region is in its study stages, and we are progressing in developing small hydro-electric projects for remote communities. These projects, together with our efforts to help homeowners to convert from oil heating, are outlined in more detail later in this report.

Hydro's strategy, supported by the provincial government, is to reduce dependency on coal and oil-fired generation and rely increasingly on nuclear and hydro-electric capacity. These less expensive and indigenous fuel sources will not only help moderate future rate increases but, by reducing the quantity of coal burned, will lower our acid gas emissions.

Although these initiatives toward economic improvement were progressing, Hydro had to face tough economic realities. Among these was the growth rate in the demand for electricity and the rising cost of coal and oil. These factors led to decisions to mothball two units at the Lennox oil-fired station and to cancel the second unit at the lignite-fired station at Atikokan.



Another reality facing utilities everywhere is the combined effect of inflation and high interest rates. In 1983 the cost of supplying Ontario's electricity will be \$554 million more than in 1982. The bulk of this will have to be met through increased rates. That is why we have applied to the Ontario Energy Board for an average rate increase of 13.9 per cent — slightly above the forecast rate of inflation.

Also, in the next four years we expect to borrow at varying terms a projected \$12 billion. By 1985 our annual interest charges will be roughly three times 1981 levels — close to \$2 billion.

Hydro is also facing the need to continue to meet environmental requirements as defined by various governments and agencies. These include measures to reduce acid gas, maintain the extremely high standards of nuclear safety, and appear before energy and environmental assessment boards. All these initiatives are essential if the environment in Ontario is to be maintained and improved. The public demands no less than this, even though these activities are costly.

And we face other realities. Currently the people of Ontario enjoy tremendous benefits from secondary energy sales, primarily in the United States. In 1982, we estimate about \$500 million in gross revenues from this source. But it is a highly competitive market, aggressively pursued not only by Quebec and Manitoba, but by some United States utilities with spare capacity. I believe we must do everything we can to continue to supply this market so as to preserve the economic benefits for Ontario.

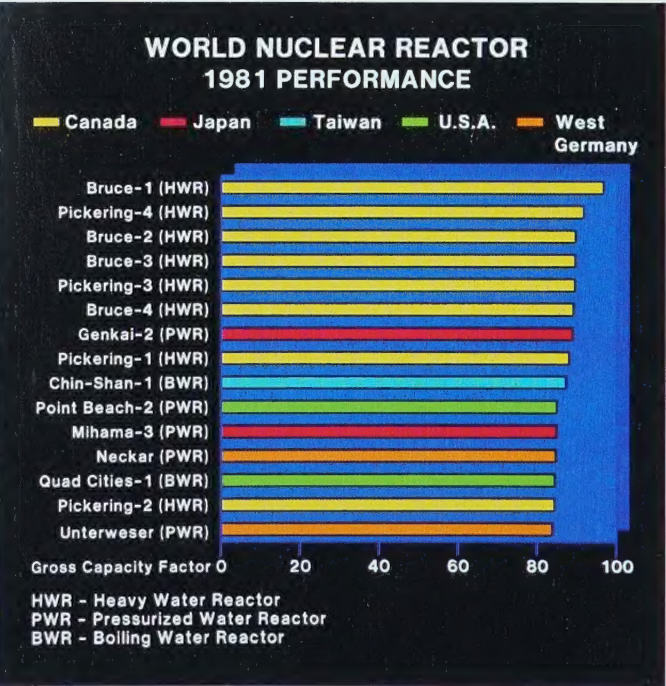
Hydro's management and staff are ready to meet these challenges. The coming decade will require of us all the very best in dedication, ingenuity and frugality. Cost effectiveness has to be the key word for Ontario Hydro in all its endeavors. Every expenditure, whether long-term or short, will need to be scrutinized to ensure that it is needed and workable.

Our past illustrates clearly we did meet our major challenges. Today, our rates are competitive, our workforce dedicated and able, and our technical achievements are world-renowned. We intend to

continue to serve the people of Ontario at the high standards to which they are accustomed.



Hydro technicians conduct routine maintenance on the reactor face at the Pickering nuclear station near Toronto.





# Hydro's nuclear reactors world's top performers

## Nuclear energy becomes top generation source

DESPITE THESE WINDS OF CHANGE, Hydro's primacy in providing a reliable and adequate supply of electricity continued during 1981. Primary electrical energy demand reached record heights of 101.7 billion kilowatt-hours — 1.5 per cent more than 1980 and just slightly below forecast. This shortfall resulted primarily from warm weather during April and December and strikes in the steel and pulp and paper industries.

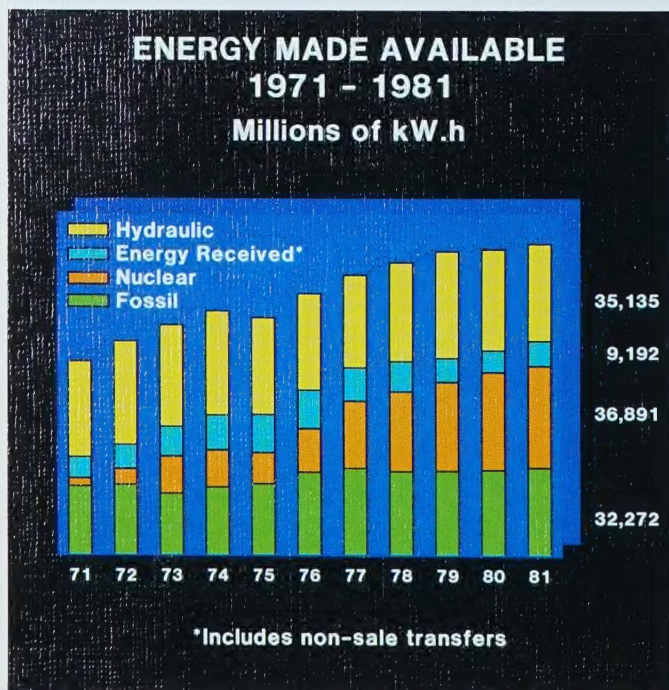
While this record demand was met from the integrated power facilities of Ontario Hydro, nuclear energy for the first time exceeded every other source of generation in our system. Of the 113.5 billion kilowatt-hours of energy supplied in 1981 — 1.7 per cent more than 1980 — nuclear sources provided 36.9 billion kilowatt-hours, water power provided 35.1 billion kilowatt-hours and coal 32.2 billion kilowatt-hours. The remainder came mostly from energy purchased from neighboring utilities and a

small amount from oil generation. And it is interesting to note that in 1981, Hydro would have had to burn an extra 12.5 million megagrams (13.8 million tons) of coal to produce the equivalent amount of electricity generated in Ontario's nuclear stations.

Again in 1981, Hydro's nuclear reactors were acclaimed among the world's best performers. Of the eight reactors operating at Bruce and Pickering, seven were in the top 10 compared with 130 large commercial reactors around the world. And this outstanding technical achievement was recorded only 10 years after the first reactors went into operation at Pickering in 1971.

After years of delays and frustrations caused by fire and faulty equipment, the coal-fired Nanticoke generating station reached its full output of four million kilowatts on December 7. Employees at the plant also set their second mark of one million man-hours without a lost-time accident on November 11. (The first period was between 1976 and 1977.)

For the first time in many years, the annual peak demand of 17.2 million kilowatts was reached on January 12 when the daily mean temperature was  $-18^{\circ}\text{C}$ . This all-time high peak was 1.5 per cent above forecast and exceeded the 1980 peak established on December 17 by 2.3 per cent.



## New unit at Thunder Bay helps meet northern needs

THUNDER BAY UNIT 2, with a capacity of 150,000 kilowatts, was the only new generating unit added to Hydro's power system in 1981. It was declared in-service on September 15, and Unit 3 is scheduled to be in-service by mid-1982. Both will burn low-sulphur Western Canadian lignite. Together with the single 200,000-kilowatt unit being constructed at Atikokan, the Thunder Bay extension will meet the 300,000-kilowatt increase in Northwestern Ontario demands forecast between now and 1990.

## Nuclear workforce reaches 5,700

CONSTRUCTION OF THE 3.6 million-kilowatt Darlington nuclear station moved into high gear during 1981 following an April order by Hydro's





*Upgrading of equipment in older hydro-electric stations has added substantially to Hydro's generating capacity.*



Board of Directors to speed up in-service dates of the first two units by six months and the second two by 12 months. By year's end, the work force totalled 735 and will reach a peak force of 2,800 workers by 1985. The station is now scheduled for completion by 1990.

Work progressed on the four new units at Pickering 'B' and four at Bruce 'B', which will add five million kilowatts to the Hydro power system. At year's end, more than 2,000 workers were on the job at Pickering and close to 3,000 were employed on the Bruce project. These eight new reactors are sched-

uled to be progressively placed in service by 1987.

At the Bruce Nuclear Power Development, two units at Bruce Heavy Water Plant 'B' were declared in-service in March and June of 1981. Bruce Heavy Water Plant 'A', which was shut down for six months during 1981 for planned maintenance work, produced 408 megagrams (456 tons) of reactor-grade heavy water during the year, for a total Hydro production of 810 megagrams (892 tons) in 1981.

The Douglas Point nuclear station was returned to 100 per cent power in November, 1981 following approval by the Atomic Energy Control Board of modifications to the 200,000-kilowatt station's emergency coolant system.

### Hydro-electric projects studied

IN 1978 HYDRO ANNOUNCED a program to study the addition of 2,000,000 kilowatts of hydro-electric power to the provincial grid by developing new sites and expanding existing plants on Ontario's northern rivers. At that time 17 sites were identified, but studies completed in 1981 showed only 10 would be economical. Of these, four involve plant expansions and six are new developments. Specific project environmental studies will be carried out for the above developments, beginning with two sites on the Little Jackfish River. The studies will assess the potential impacts caused by the development of the generating stations and a 230 kilovolt transmission linking the stations with the grid. Additional sites are being investigated for inclusion in the program.

On the St. Lawrence River, a \$5 million, two-year project was launched in 1981 to correct a warping problem affecting the 16 hydraulic generators at the Robert H. Saunders station. And at the Sir Adam Beck station at Niagara Falls, the Chippawa canal received its first clean-out in 16 years. These extensive dredging operations achieved water-flow recovery of 90 per cent.

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### ***New extra-high-voltage lines link southern power system***

EXPANSION OF THE Extra High Voltage (EHV) system, begun in the 1970s, was virtually completed



*Ontario Hydro engineers assisted Hydro-Quebec in determining the causes of cracks in the buttress face at Manic 5 dam in northeastern Quebec.*





*Two new units at the Bruce Heavy Water Plant 'B' were declared in service during 1981.*

during 1981, with the placing in service of a 45-km (27.9-mile) section between Cherrywood Transformer Station (TS) and Claireville TS; and Claireville TS to Kleinburg TS. This section represents the vital link in the southern Ontario bulk transmission system which connects generating stations east, west and north of Metro Toronto.

In addition to the 500-kV lines, a number of 230-kV and 115-kV lines and stations projects were completed. The new portion of the Thunder Bay generating station was connected to the power system by completing a transmission line from Thunder Bay to Port Arthur Birch TS. Supply to Prince Edward County in eastern Ontario was reinforced through construction of a 230-kV line from Lennox generating station to the Picton TS.

A new construction method for upgrading 230-kV lines developed in 1980 was successfully used in 1981. The method permits lifting of double-circuit towers



*Cross-country skiers find the rights-of-way beneath transmission lines ideal for their winter sport.*



and installing them on new bases, without taking the line out of service.

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### ***Acid gas emissions to be cut in half by the year 1990***

AS ANNOUNCED EARLY in 1981 and reiterated in the chairman's section of this report, Ontario Hydro is committed to cutting its acid gas emissions from coal-fired stations by 50 per cent by 1990.

As a leader among the world's utilities in environmental control, Hydro continues to meet all provincial government regulations on acid gas emissions. Also, Hydro has been monitoring acid gas since 1974 and has had programs in place to reduce these emissions.

Principal among these is the expansion of our nuclear and hydro-electric stations, which will reduce our need for coal-fired generation and cut emissions substantially over the next 10 years. Another program involves the blending of U.S. coal with low sulphur Western Canadian coal, which reduces sulphur dioxide emissions by about 15 per cent. Hydro also buys washed coal which cuts the sulphur content by about 20 per cent.

Further reductions will be achieved by using low sulphur Canadian lignite at the Thunder Bay station extension and at the unit being constructed at Atikokan.

In addition to these on-going programs, Hydro will spend a further \$600 million to help fulfil the 1981 agreement with the Ministry of the Environ-



*The Great White Pelican, which nests near Fort Frances, is on Hydro's endangered species list.*



ment limiting Hydro's acid gas emissions to 450,000 tonnes by 1986 and 300,000 tonnes by 1990. This compares with the expected 1982 levels of 600,000 tonnes.

Hydro will modify 712 burners at Nanticoke, Lambton and Lakeview stations to reduce nitric oxide levels by about 25 per cent overall. During 1982, \$3.8 million will be spent to modify burners on a unit at Nanticoke and a unit at Lakeview.

Hydro will also install flue gas scrubbers on two units at either Nanticoke or Lambton by 1986. These scrubbers, worth \$350 million, will remove about 90 per cent of the sulphur dioxide from the two units.

Other measures in the program could include using increased amounts of low sulphur coal and the purchase of additional hydro-electric energy from Manitoba and Quebec.

While these programs are costly — they will mean an approximate 1.5 per cent increase in Ontario electricity rates by the mid-1980s — Hydro believes they are essential steps in the international struggle toward clean air.

## Estimated cost of supplying electricity is \$3.6 billion

IN JANUARY, 1982 Ontario Hydro introduced rate increases averaging 9.6 per cent to the province's 324 municipal utilities, and averaging 10 per cent to about 100 large direct industrial customers. Customers of Hydro's rural system received an increase averaging 8.7 per cent. However, following an amendment to the Power Corporation Act passed by the Ontario Legislature in October, 1981, year-round, rural residential customers will be helped to reduce their electricity bills in 1982. The difference in rates between year-round, rural residential customers and urban customers will be reduced to 15 per cent at a monthly consumption of 1,000 kilowatt hours. Without this assistance, rural residential customers were forecast to have to pay an average of 28 per cent more in 1982 than their urban counterparts. The money needed for this help is provided by collecting some \$34 million from all Hydro customers in 1982 — increasing bulk power costs by

### MONTHLY RESIDENTIAL ELECTRIC BILLS\* 1 000 kW.h JANUARY 1982

New York . . . . .	\$119
Charlottetown . . . . .	100
Boston . . . . .	88
Detroit . . . . .	77
Chicago . . . . .	72
Los Angeles . . . . .	69
Tampa . . . . .	64
Birmingham . . . . .	56
Washington D.C. . . . .	53
Fredericton . . . . .	53
Little Rock . . . . .	52
Atlanta . . . . .	52
St. John's . . . . .	51
Halifax . . . . .	49
St. Louis . . . . .	47
Louisville . . . . .	46
ONTARIO — Rural** . . . . .	46
TVA — Rural . . . . .	46
Vancouver . . . . .	41
ONTARIO — Municipal Electric Utility Average . . .	40
Calgary . . . . .	38
Regina . . . . .	36
Portland, Oregon . . . . .	34
Montreal . . . . .	34
Winnipeg . . . . .	31

\* Standard residential bills in local dollars including fuel cost escalators where applicable but excluding sales taxes or special local charges.

\*\* A deduction of \$5.40 was made to reflect the monthly rate assistance provided to year-round rural residential customers.

about 1.3 per cent.

In 1983, the cost of supplying electricity will total an estimated \$3.6 billion, \$554 million more than in 1982. About \$110 million of this increase will be obtained from increased sales, leaving about \$444 million to be raised by the 1983 rate increase. Accordingly, Hydro has proposed to the Ontario Energy Board increases of 13 per cent to the municipal utilities and an average of 14.8 per cent to large direct industrial customers. Export sales to the United States in 1983 will continue to help offset the cost of supplying electricity in Ontario. Without



these sales, 1983 rates would be about 8 per cent higher than proposed.

### New costing and pricing proposals

AFTER MANY YEARS of joint study and review with Hydro's bulk power customers and their representative groups, our 1983 rate increase proposals include introduction of new costing and pricing policies.

One major new policy leads to the use of time-of-use rates for billing municipal utilities, direct industrial customers and the rural retail system. Put simply, time-of-use rates recognize that the demand for electricity varies over the day and over the year. The facilities needed to meet the peak electricity demand — and the funds needed to build them — are greater than those needed to meet demand in off-peak periods. And since costs of meeting the period of peak electricity demand are higher, the price of electricity should be higher during periods of such peaks.

The major change in the policies is to base rates on an explicit set of pricing objectives. Time-of-use pricing flows from those objectives, as does a new method for determining the relative weight to be

given the demand and energy charges. This, in combination with time-of-use rates, will aid in moderating customer costs over the long term by providing an incentive to conserve energy and manage electricity demands during the daily cycle.

### Hydro's 1981 fuel costs show 13.2 per cent jump in year

THE COST OF FUELS needed to power Hydro's generating stations during 1981 totalled \$763 million, compared to \$674 million in 1980 — an increase of 13.2 per cent.

Total coal deliveries to generating stations from U.S. mines totalled 8.3 million megagrams (9.2 million tons). Contract coal shipments were supplemented by spot coal purchases to offset the shortfall of coal which resulted from the United Mine Workers of America strike earlier in the year.

Movement of Western Canadian bituminous coal through the integrated transportation system amounted to 2.0 million megagrams (2.2 million tons) delivered to Nanticoke generating station.

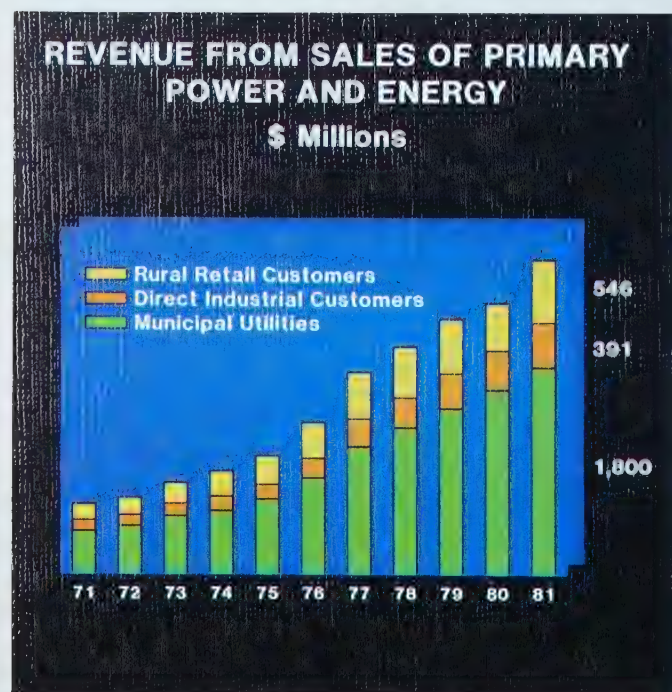
Deliveries of the first lignite coal from Western Canada to Thunder Bay generating station started in 1981. The initial shipments were for test burning and commissioning purposes. Deliveries totalled 0.5 million megagrams (0.6 million tons) and full contract deliveries are expected to start in 1982.

Residual oil deliveries totalled 0.07 million cubic metres (0.4 million barrels), to support the steam production requirements of the Bruce Heavy Water Plant and for reduced requirements at Lennox generating station. Commencing in 1981, natural gas was used for boiler ignition purposes only.

Total nuclear fuel deliveries to Hydro-owned stations were 970 megagrams of uranium in 1981.

Development of facilities for the production of uranium supplies under contract with two Elliot Lake producers continued in 1981, with the Denison project nearing completion. The two agreements provide for the supply of uranium concentrate containing approximately 72,000 megagrams of uranium over the period 1980 to about 2020.

In an amendment negotiated in 1981, total deliveries under the Denison contract were reduced





from 48,400 megagrams of uranium to 44,200 megagrams; the contract was also extended by one year to 2012. Hydro notified Rio Algom that it will exercise its option to reduce annual deliveries from the Stanleigh mine by 15 per cent over the next 20 years. This will not affect the total amount of concentrate to be supplied under the contract since the entire reserve is dedicated to Hydro.

## Bulk of Hydro purchases awarded to Ontario firms

THE TOTAL VALUE of Ontario Hydro purchases of fuels, equipment, material and services during 1981 was \$2 billion, an increase of \$300 million from 1980. During 1981, outstanding commitments were \$2.8 billion, an increase of \$200 million from 1980.

Canadian suppliers, excluding primary fuels such as uranium, coal, oil and gas, received 85.8 per cent of the total value of 1981 purchases, and of this amount 89.9 per cent was awarded in Ontario. This represents an increase of six per cent of the value of Canadian awards from 1980.

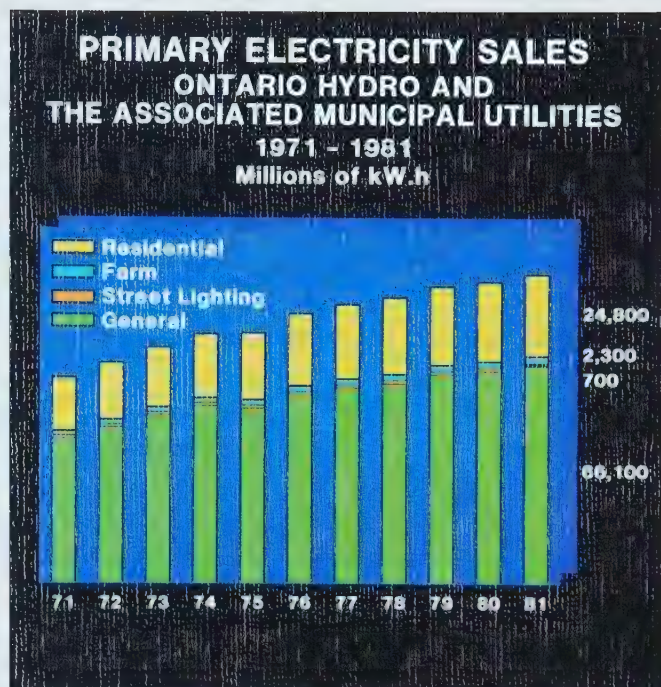
In general, the availability of material was satisfactory during 1981, but cost increases generally reflected inflationary trends with consequent effects on electricity prices.

## Export sales help moderate rate increases in Ontario

EXPORT OF ELECTRICITY to the United States was higher than in 1980 and continued to moderate increases in the cost of electricity for Ontario customers during 1981. The net profit from such sales totalled \$190 million and this money was used to reduce Ontario electricity bills by 6.5 per cent during the year.

Part of these exports resulted from a three-year agreement reached early in 1981 — and later approved by the National Energy Board — to dedicate the total output of the J. Clark Keith generating station in Windsor to supply General Public Utilities (GPU) of New Jersey via transmission lines in Michigan and Ohio.

Other export initiatives included signing a letter



of intent with GPU for the supply of power via a proposed 105-km (63-mile) high-voltage, direct current cable running under Lake Erie. The project is estimated to cost \$800 million, with Ontario's share of the underwater cable estimated at \$275 million. Each utility would pay for its own on-shore facilities, which amounts to \$125 million in Hydro's case. It is estimated that over the 10-year life of the contract a total of \$3 billion of revenue will be received, with Ontario's net revenue reaching \$1 billion. Early in 1982 Hydro presented the proposal to the National Energy Board for approval. The NEB decision will be followed by federal and provincial Cabinet reviews.

## Hydrogen fuel storage is focus of Hydro research

RESEARCH IN MANY VITAL AREAS continued throughout 1981, including the safe storage and transportation of nuclear waste, control of acid gas emissions, development of alternate energy sources and solving technical problems associated with electricity generation.



Under the terms of the federal-provincial Nuclear Fuel Waste Management Program, Ontario Hydro is responsible for studies in the interim storage and transportation of irradiated fuels. During 1981, research in this sector involved developing welding processes for the fabrication and final closure of containers for spent-fuel disposal for AECL.

Research also continued in the monitoring and the long-range atmospheric tracking of acid gases, their effects on unbuffered soil and the biological effects acid rain has on Ontario lakes.

In the field of hydrogen research — probably the

fuel of the 21st century — Hydro's efforts concentrated on methods of hydrogen storage as a vehicular fuel. Solar energy for water heating also came under continued study. High priority has been given to the reduction of equipment capital and installation costs to improve the cost/benefit ratios.

A major research achievement in 1981 led to developing a safe and economical way to remove polychlorinated biphenyls (PCBs) from transformer oil. The method is simple, completely contained, with a byproduct of common salt and the recovered oil being reusable. Studies are now under way to ensure that byproducts and their disposal meet environmental requirements.

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## *Alternate energy sources include hydrogen, fusion*

DESIGN AND DEVELOPMENT of our electrical generation and transmission system proceeded at full pace during 1981. Also included were many aspects of Hydro's search for alternative energy sources, including active involvement in the fusion energy program and a study of hydrogen supply technology and costs was completed in June, 1981 for the Ontario Hydrogen Energy Task Force.

In the matter of irradiated fuel management, Hydro committed approximately \$4 million, primarily in the development of a facility, designed to isolate radioactive material from the environment.

Engineering studies also proceeded on control of acid gas emissions, involving flue gas desulphurization equipment and low nitrogen oxide burners in coal-fired stations.

Extensive work was also carried out with Atomic Energy of Canada Limited to demonstrate adequacy of nuclear station design at Bruce Generating Station 'A', and to provide the basis for obtaining construction approval for Darlington nuclear station.

In 1981 a contract was let to Sulzer Canada Incorporated for the design and supply of equipment for the tritium removal system at the Pickering nuclear station. Construction of the system at an estimated cost of \$67 million was approved by the



*Heat and stress testing of alloys was just one of a myriad of assignments for Hydro's research division.*





*The Mini-Hydel generator, pictured here at Wasdell Falls, is designed to replace diesel-powered units.*



Board of Directors in 1980 and is to be in service by 1985. The facility will remove radioactive tritium from the reactors and concentrate it in chemical form that can be safely stored, thereby maintaining and improving worker and public safety.

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## *Hydro continues its policy of broad public involvement*

EXPANDING FACILITIES as needed to meet future electrical demand, as well as improving system reliability, are crucial Hydro concerns. At the same time, Hydro encourages the public's participation in the planning process, even when this means longer lead times in planning expansion projects. With a commitment to this public right and by conducting innovative programs, Hydro continued its policy of public involvement in the planning of its power facilities.

In 1981, 25 provincial organizations having an interest in Hydro planning participated in the ongoing review of Hydro's public participation program.

Hydro continued to assess the effect of projects on people and communities. Social impact assessments were carried out for projects in the planning stages. Ongoing community impact management and monitoring helped to mitigate the effects of projects on communities.

After extensive public involvement — including five working groups, information centres, committees, public meetings, newsletters and news media involvement — the environmental assessment study on the system plan for the Southwestern Ontario bulk power supply project was submitted to the provincial government for review. The new transmission facilities are needed to improve the security of power supply to Southwestern Ontario, incorporate power from the four new Bruce 'B' CANDU reactors now under construction, and improve our interconnections with neighboring U.S. utilities. Public hearings into the study began in January, 1982. At the same time, hearings began on the Eastern Ontario bulk power supply study. Additional

transmission facilities are needed in Eastern Ontario to augment electrical supply to the Ottawa area and strengthen interconnections with neighboring utilities.

Environmental assessments were also completed on increasing electrical supply to the Guelph, Southeast Essex and Elliot Lake areas. In total, 21 environmental assessments were under way on transmission projects during the year.

In December 1980, Hydro's "Class Environmental Assessment" was approved by Government. The "Class E.A." approach speeds up the formal review and decision-making procedure by enabling the Minister of the Environment to approve, following a single review, certain projects which occur frequently, are small in scale, and have acceptable environmental effects. Examples are minor transmission lines and minor transformer stations. In the first full year of "class" assessments, Hydro had 27 in progress and gained government approval for seven.

Hydro also received almost 8,000 local planning and zoning bylaws for review and challenged — with a success rate of 90 per cent — those that contravened the Corporation's right to operate and expand facilities in the public interest.

In the summer and fall, Hydro's electrical effects demonstration program took to the road, illustrating the effects of high-voltage power lines on people, animals and farm equipment. The demonstration program enjoyed a 10-fold audience increase in 1981.

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## *Energy advisory program reaches rural customers*

IN 1981, ADDITIONAL INITIATIVES were introduced into Hydro's conservation programs, placing special emphasis on the effective as well as efficient use of energy. Principal among these was the Residential Energy Advisory Program (REAP) in which Hydro offers its rural residential customers a complete survey of the energy efficiency of their homes at no cost. Following pilot tests of the program in three rural areas, a 10-year program was authorized by Hydro's Board of Directors in July, 1981. Later, the Ontario





Community relations staff on the fall fair circuit show farmers how to counter the electrical effects of high-voltage lines crossing their land.



Lia Vereecken-Sheehan, a diver with Hydro's Biology Services and Resources Unit, prepares for a wintry task. She will inspect strobe lights that keep fish from entering the outfall system at the Pickering nuclear generating station.



Municipal Electric Association and the Association of Municipal Electrical Utilities jointly endorsed the program and recommended that the municipal utilities implement their own REAP program.

Ontario Hydro launched the REAP program September 1, 1981, and by the end of the year more than 2,000 customers had requested and received energy surveys of their homes. Also as part of the REAP program, Hydro is making available loans up to \$2,000 to both rural and municipal customers toward the cost of improving the energy efficiency of their homes. The loans are subject to the customer first having exhausted federal energy assistance grants and paying the first \$200. The Hydro loans carry interest rates based on Hydro's current rate of borrowing.

Installation and testing of load management monitoring and control equipment continued in 1981 in 375 residences and 11 commercial buildings in Oshawa and Scarborough. Load management is designed to shift customer use of electricity from periods of high demands to times of low demand. Its objectives are to improve power system efficiency and encourage a shift of fuel dependency from less-abundant fuels — such as coal and oil which are used to meet peak demands — to more abundant and less-expensive nuclear and hydro-electric generation which provides most of the off-peak demands.

## *Hydro expertise in demand by many foreign countries*

HYDRO IS RECOGNIZED AS A WORLD LEADER among electrical utilities, and our expertise was much in demand in other countries during 1981. A Technical Cooperation Agreement with the Korea Electric Company resulted in information exchanges between the two utilities and, through an agreement with Atomic Energy Canada Limited, 32 Hydro employees travelled to South Korea to help commission the Wolsung-1 nuclear plant. Another agreement with AECL sent a Hydro operating team of 13 to commission the Cordoba Nuclear Station in Argentina between 1981 and 1983. And teams of six and eight

respectively were sent to Pakistan and Ghana to train personnel to operate high-voltage transmission facilities.

As well, Hydro assisted AECL in designing the station and site layout and in drawing up a construction schedule for AECL's proposal to Mexico for a four-unit nuclear station. If the bid is accepted — the decision is expected in the summer of 1982 — Hydro will contribute up to 50 staff to a team that would help manage the project construction and engineering functions.

## *New human resources branch to encourage staff training*

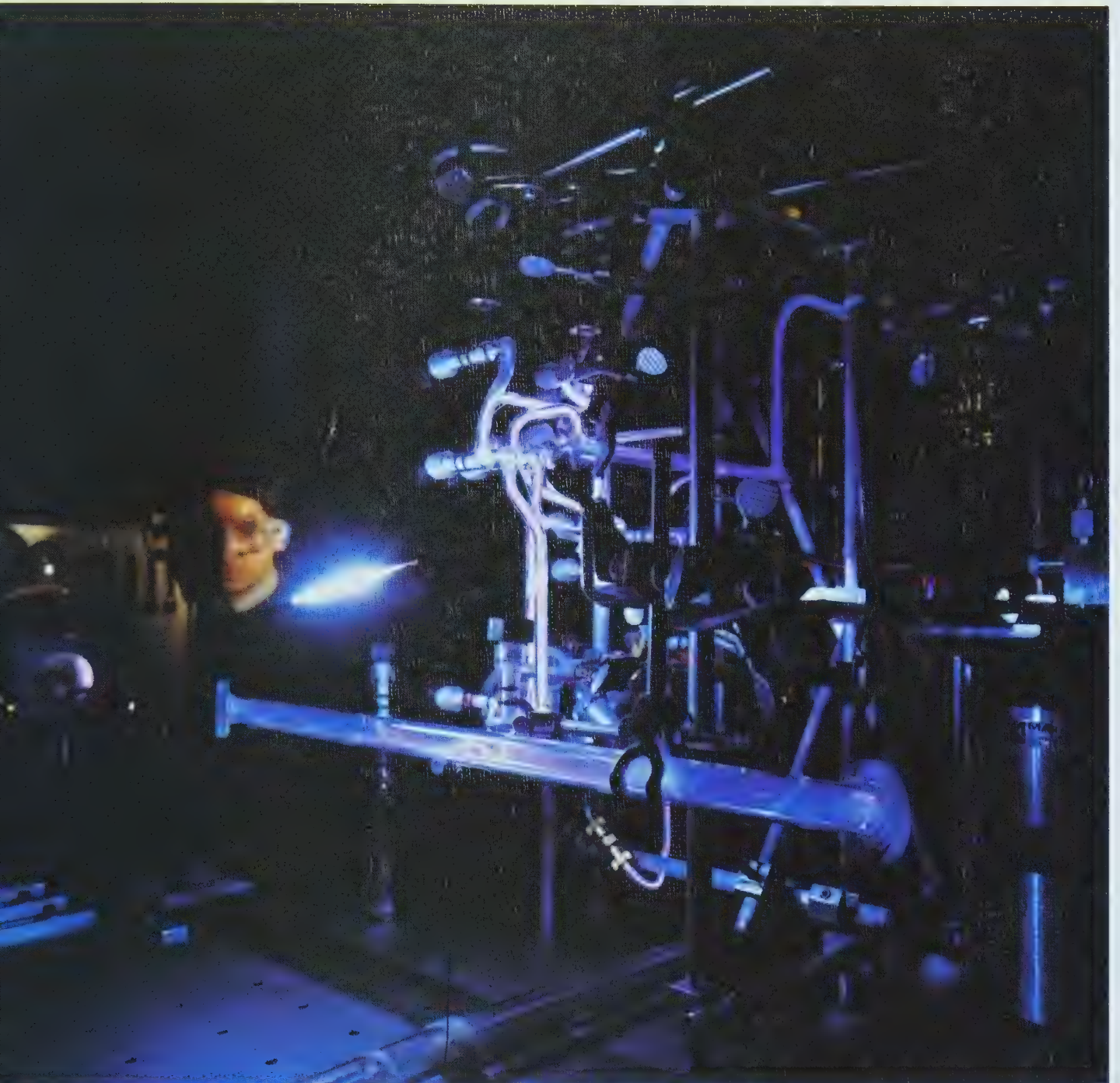
PEOPLE ARE HYDRO'S primary resource. In recognition of this, a Human Resources Branch was formed in 1981 to encourage actions which result in the continued dedication, productivity and job satisfaction of all employees.

In these times of intense competition for professional and technical staff, Hydro, by maintaining a high profile in the market and at the universities, was able to hire the people it needed. Furthermore, people already on staff were given opportunities to enhance their skills. All sectors of the Corporation



*The workforce at the 3.6-million kilowatt Darlington nuclear plant will peak at 2,800 in 1985.*





*Studies to determine an economic alternative to the present process of producing heavy water continued at Hydro's W.P. Dobson research laboratory in Etobicoke.*



— from linemen and foresters to supervisors and professional staff — participated.

Attitude surveys and discussion with employee representatives helped keep management abreast of employee concerns and problems. Every effort was made to continue matching individual and organizational needs. By the end of 1981, more than 1,000 employees had participated in a continuing program to identify and encourage the development of staff with management potential.

Informal “straight talk” discussions between employees and senior executives became a common

practice during the year with Chairman Hugh Macaulay and myself on hand to field questions.

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### ***Equal opportunity program will broaden its focus***

THROUGHOUT 1981, HYDRO continued its program designed to see that both current and prospective women employees enjoy equal selection, training and advancement opportunities with men. In 1981, Hydro exceeded its target for hiring women university graduates; held pilot career planning seminars for more than 50 non-professional staff, most of whom were women; and increased the number of females in the managerial and professional ranks of the Corporation. While this program is helping to achieve equal opportunity for women, more can and will be done in future.

This program will also broaden its focus over time to assist traditionally disadvantaged employees by helping them to apply for job vacancies and supplying information and other assistance needed for career planning. Hydro continued its practice of determining job requirements and selecting candidates who have the abilities and experience to meet them.

### **Settlements reached with employees**

THE SOCIETY of Ontario Hydro Management and Professional Staff, representing 5,700 employees, was awarded an arbitrated increase of 11.63 per cent for 1981. Topics under discussion with the Society included redress procedures, relocation assistance and the negotiating process.

In December, the parties reached a mediated settlement on 1982 compensation requiring a 10 per cent increase at the first of the year, and a further 4.45 per cent (non-compounded) in June.

The 16,000 members of the OHEU received a 7.8 per cent pay increase for the year beginning in April, 1981 and further increases totalling 3.6 per cent during the final months of the contract year based on the cost-of-living provision in the agreement.



*Hydro technicians use a seismometer to test rock stability on the banks of the Niagara River.*





*Bill Clark displays the latest fashions in personnel protective equipment worn by Ontario Hydro workers.*



Bargaining for a new contract was concluded on schedule and the two-year agreement increases pay by 12.8 per cent in 1982 and 10 per cent in 1983. A cost-of-living clause applying in the second year provides up to 4 per cent if the Consumer Price Index rises a similar amount beyond 10 per cent.

### *Hydro dedicated to improved health and safety policies*

IN 1981 HYDRO both maintained its enviable safety record and introduced new safety policies and techniques dedicated to reducing the fatality rate by 50 per cent within the decade. A fall-arresting system and an energized-line warning device were developed, electricity-resistant footwear was introduced and ergonomic studies were undertaken.

Moreover, as President, I now personally review the more serious accidents. Last year, there were three occupational deaths and one total disability and a disabling injury rate of 5.1 per million man-hours — down from 5.3 in 1980.

#### **Excellent record continues**

HYDRO CONTINUED its excellent record in nuclear safety last year as radioactive emissions were generally within one per cent of Atomic Energy Control Board limits. No staff or public injuries or fatalities occurred.

As part of the continual monitoring of nuclear workers, a chromosome testing program was introduced, the first such program in Canada.

Along with the Ontario emergency planning authorities, Hydro participated in exercises on emergency response and communications capability at the Pickering and Bruce nuclear generating stations.



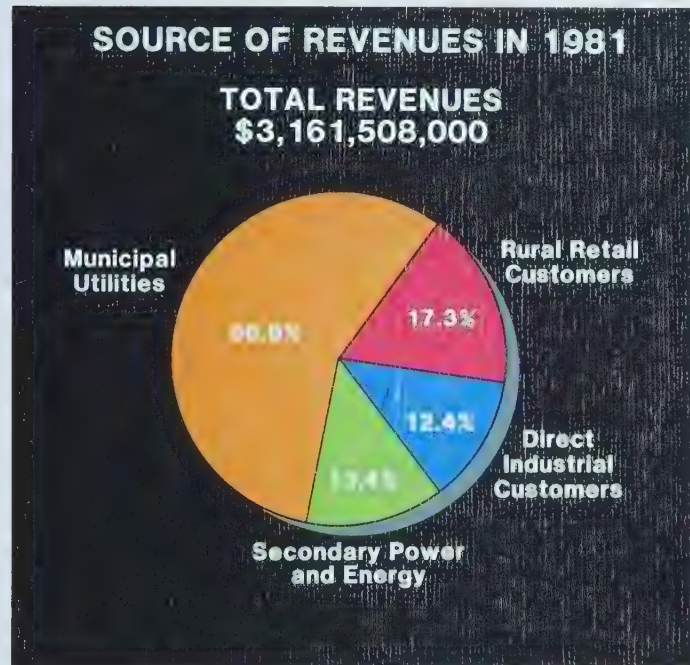
*Members of Ontario Hydro's Board of Directors visit the Bruce 'A' nuclear generating station, home of the world's top performing reactor.*





## Financial Review

Ontario Hydro's revenues in 1981 totalled \$3,162 million. Primary sales of electricity to customers in Ontario amounted to \$2,737 million, while secondary sales mainly to United States utilities totalled \$425 million in 1981. Primary revenues increased 11.3% or \$278 million due to a 9.4% increase in power rates and a 1.9% increase in the volume of sales. Secondary revenues increased \$64 million or 17.7% over 1980 largely as a result of higher prices for electricity sold to United States utilities. The income from these export sales reduced the costs to customers in Ontario by approximately \$190 million or 6.5%.



The excellent performance of Hydro's CANDU nuclear reactors together with the income from export sales helped to keep the average cost of electricity to customers in Ontario below the rate of inflation. The average increase in rates for municipal utilities was 9.3%, while the average rate increases for direct industrial customers and rural retail customers were 9.6% and 11.2%, respectively. To reduce the differential between rural and urban residential electricity rates, the Province of Ontario contributed \$20 million to Ontario Hydro in 1981. These funds enabled Hydro to reduce the impact of the 11.2% rate increase on rural residential customers.

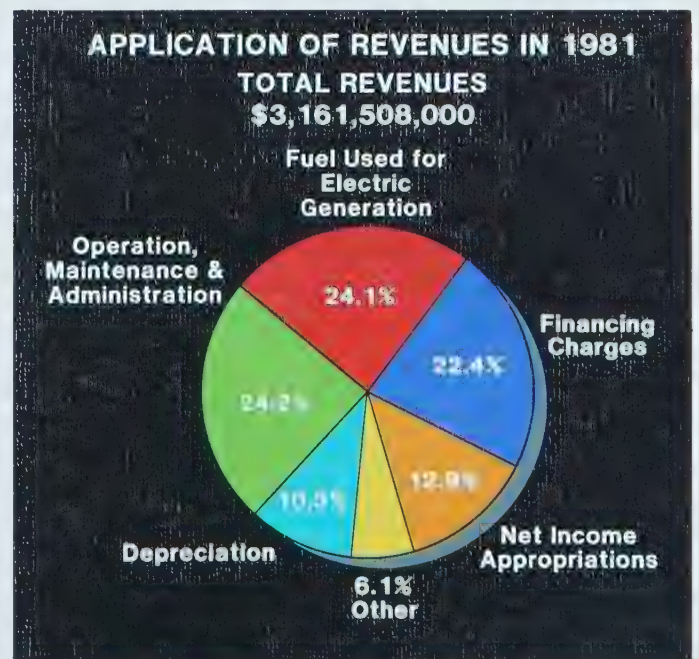
Ontario Hydro's total operating costs in 1981 amounted to \$2,755 million compared to \$2,443 million in 1980, an increase of 12.8%. Costs increased largely as a consequence of escalating prices for fossil fuels, and continuing inflationary pressure on the costs of labour, materials and purchased services.

Energy related costs including fuel and purchased power increased 16.2% over 1980. For the first time, more electric energy was supplied by nuclear generation in 1981 than any other single source. Electric energy generated by nuclear stations supplied 33% of total energy made available, while hydraulic stations supplied 31% and higher cost fossil-fueled

generation provided 28%. Purchases of power from inter-connected utilities provided 8% of the energy available in 1981. The cost of fuel used for electric generation from all sources totalled \$763 million in 1981, an increase of \$89 million over 1980. This higher cost was a result of two factors, the increased volume of energy generated in 1981, and higher average unit costs of fuels consumed. Increased amounts of purchased power also helped to reduce the use of higher cost fossil-fueled generation in 1981. These purchases totalled \$128 million, an increase of \$28 million over 1980. In addition, payments to Atomic Energy of Canada Limited and the Province of Ontario, as required under the nuclear payback agreement, increased in total by \$14 million during 1981. These payments were made in proportion to the capital contributions of these parties to the construction of the Pickering Nuclear Generating Station units 1 and 2, and reflect the growing advantage of nuclear over coal-fired generation.

During 1981, costs associated with the operation, maintenance and administration of Ontario Hydro's in-service facilities amounted to \$765 million. This increase of \$125 million over 1980 was primarily the result of escalation in labour and other costs, and increases in the cost of operating and maintaining the generation and transmission facilities.

Depreciation costs in 1981 increased to \$325 million, up 6.1% from 1980. This increase resulted primarily from the second unit at the Thunder Bay Thermal Generating Station being placed in-service and the addition of new distribution and service facilities during the year.



Interest and foreign exchange costs charged to operations totalled \$709 million in 1981, \$35 million or 5.1% higher than 1980. These higher financing costs resulted primarily from a \$33 million increase in foreign exchange costs during the year, reflecting the higher level of the Corporation's foreign



debt repayable within one year and the higher exchange costs on foreign transactions during 1981. Higher interest rates during 1981 and additional borrowings for the capital construction and heavy water production programs resulted in an increase of \$204 million or 17.5% in interest costs over the previous year. As these increased interest costs were primarily associated with financing construction and heavy water production activities, the major portion of this increase was added to the cost of constructing new facilities and producing heavy water, and was not charged to operations.

Ontario Hydro remains a financially sound Corporation as demonstrated by its interest coverage and debt ratio indicators:

Financial Indicators	1981	1980
Interest Coverage	1.30	1.32
Debt Ratio	.841	.846

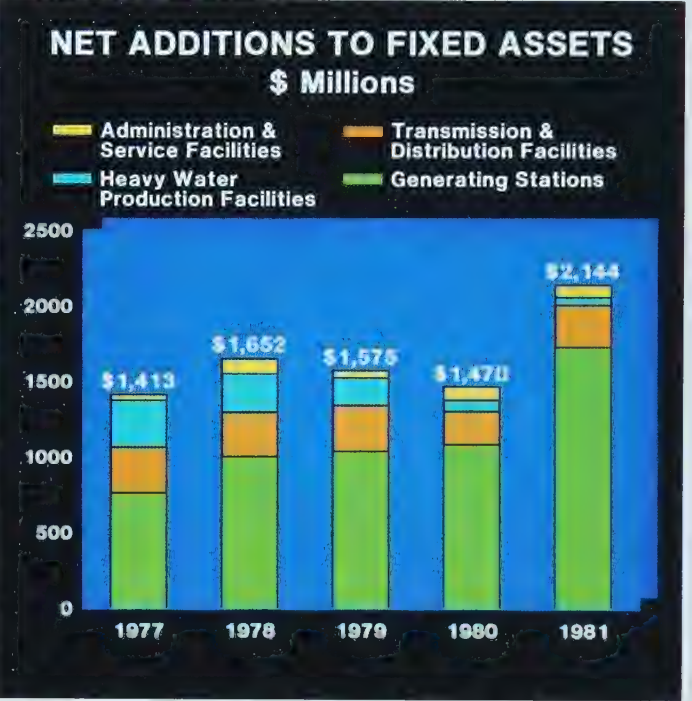
Net income for 1981 was \$407 million, \$190 higher than in 1980. However, income for 1980 was reduced by an extraordinary charge of \$160 million arising from the cancellation of the Wesleyville construction project. As required by the Power Corporation Act, \$153 million of net income was appropriated for debt retirement purposes in 1981. The remaining \$254 million balance of 1981 net income was appropriated to the Reserve for the Stabilization of Rates and Contingencies.

The funds required by Ontario Hydro to finance the construction of fixed assets were provided from two major sources, operations and debt financing. In 1981, funds from operations provided \$731 million of Hydro's total requirements, while \$1,725 million was provided by debt financing. Compared to 1980, these amounts increased by \$49 million and \$865 million, respectively.

Bonds, notes and other long-term debt issued by Ontario Hydro during 1981 totalled \$2,246 million. Canadian bonds of \$550 million were sold to the public, and a further \$500 million were issued to the Province of Ontario with respect to Canada Pension Plan funds. In addition, United States bond issues of U.S. \$550 million (Cdn. \$658 million) and Eurodollar bond issues of U.S. \$450 million (Cdn. \$538 million) were issued. The average interest rate for bonds issued in 1981 was 15.2% compared to 13.0% in 1980. Maturing long-term debt amounted to \$336 million in 1981 compared to \$428 million in 1980. In addition, during 1981, \$185 million of debt was redeemed as part of Hydro's program to support the secondary market for its securities. This compares to net redemptions of \$174 million in 1980.

To provide a reliable and economic supply of electricity for the Province of Ontario, Hydro constructs new generation and transmission facilities to meet forecast peak power and energy demands. Recent Ontario Hydro forecasts predict an average annual load growth of 3.0% over the period 1980 to 2000. Based on these forecasts, Hydro has a capital construction program which provides for the addition of 8,943,000 kilowatts of generation capacity over the years 1982 to 1990 of which 8,588,000 represents nuclear generation. Recent long-range studies indicate that it is cost effective to install new nuclear and hydraulic generation before adding large fossil-fueled stations. However, to satisfy system requirements in northwestern Ontario and provide diversity in the generation mix, Ontario Hydro is proceeding with construction of smaller coal-fired generating stations at Thunder Bay and Atikokan.

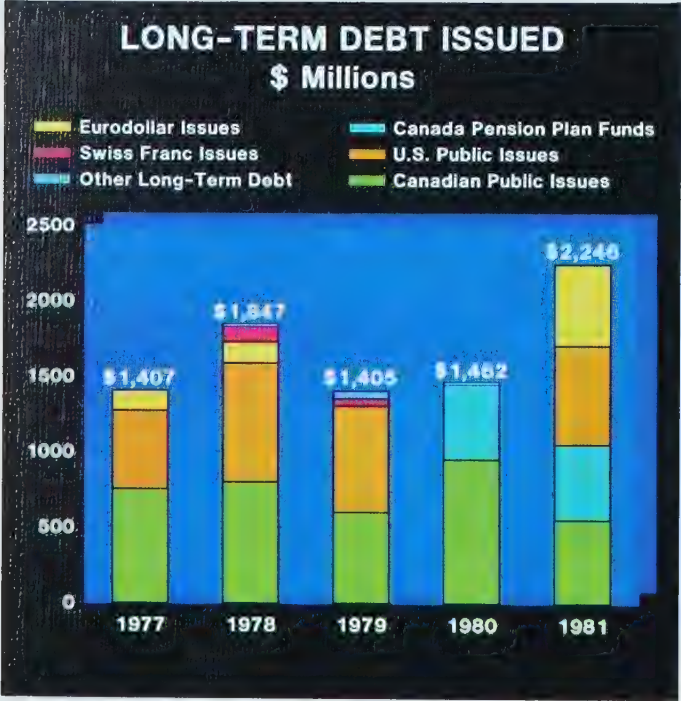
Net additions to fixed assets were \$2,144 million during 1981. Major capital expenditures were \$1,731 million for generation facilities including \$265 million for heavy water, \$278 million for transmission and distribution facilities, \$82 million for administration and service facilities, and \$53 million for heavy water production facilities. Net additions were \$674 million higher than those in 1980, mainly the result of



increased expenditures of \$498 million on generation projects and \$149 million on production of heavy water. The expenditures on major generation projects under construction during 1981 and 1980 were:

Major Generation Projects Under Construction	1981 Expenditures \$ million	1980 Expenditures \$ million
Nuclear Generation		
Bruce "B"	628	435
Pickering "B"	368	291
Darlington	196	69
Fossil Generation		
Thunder Bay	72	89
Atikokan	93	39

During 1981, a second coal-fired unit at the Thunder Bay Generating Station was placed in service at a cost of \$309 million. In addition, the final two units of Bruce Heavy Water Plant "B" were also placed in service at a cost of \$914 million.





# Summary of Significant Accounting Policies

The accompanying financial statements have been prepared by management in accordance with generally accepted accounting principles in Canada, applied on a consistent basis except for the change in accounting policy described under "Unamortized debt discount" and in note 19. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality and in the light of information available up to March 8, 1982. To assist the reader in understanding the financial statements, the Corporation's significant accounting policies are summarized below:

## Fixed assets

Fixed assets are capitalized at cost which is comprised of material, labour and engineering costs, plus overheads, depreciation on service equipment and interest applicable to capital construction activities. In the case of generation facilities, cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by units during their commissioning period. The cost of heavy water is the direct cost of production and applicable overheads, plus interest and depreciation on the heavy water production facilities. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. The effective annual rates were 11.5% in 1981 and 10.2% in 1980.

If it is decided to significantly extend the construction period of a project, interest is not capitalized on construction during the period of extension. If a project is deferred after construction has started, mothballing costs associated with the deferment are charged to operations. Interest is not capitalized on deferred projects during the period of their deferral. If a project is cancelled, all costs, including the costs of cancellation, are written off to operations.

If fixed assets are removed from service and mothballed for future use, the associated mothballing costs are charged to operations.

## Depreciation

All fixed assets in service, except land, are depreciated on a straight-line basis. Depreciation rates for the various classes of assets are based on their estimated service lives, which are subject to periodic review. Any changes in service life estimates are implemented on a remaining service life basis.

The estimated service lives of assets in the major classes are:

Generation	— hydraulic	— 50 to 100 years
	— fossil and nuclear	— 30 years
Heavy water		— over the period ending in the year 2030
Transmission and distribution		— 20 to 55 years (1980 — 25 to 55 years)
Administration and service		— 5 to 60 years
Heavy water production facilities		— 20 years

In accordance with the group depreciation practices of the utility industry, for normal retirements the cost of fixed assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, losses on premature retirements, and the costs of removal less salvage proceeds on all retirements, are charged to operations in the year incurred as adjustments to depreciation expense.

Fixed assets removed from service and mothballed for future use are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected non-operating period.

Deferred projects are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected deferral period. On disposal of component parts during the deferral period, the cost of fixed assets less proceeds on disposal are normally charged to accumulated amortization with no gain or loss being reflected in operations.

## Unamortized advances for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel supply contracts. Where these contracts require Ontario Hydro to make payments for pre-production costs to suppliers in advance of product delivery, these payments and associated costs, including interest, are carried in the accounts as unamortized advances for fuel supplies. The advances are amortized to fuel inventory as the fuels are delivered.

## Fuel for electric generation

The cost of fuel for electric generation is comprised of fuel purchases, transportation and handling costs, and the amortization of advances for fuel supplies. Transportation costs include charges for interest and depreciation on railway equipment owned by Ontario Hydro. Fuel used for electric generation is charged to operations on the average cost basis.

## Unamortized debt discount

Debt discounts or premiums arising on the issuance of debt are amortized over the period to maturity of the debt. In addition, redemption discounts or premiums on debt acquired prior to the date of maturity are amortized over the period from the acquisition date to the original maturity date of the debt. Prior to January 1, 1981,



redemption discounts or premiums were credited or charged to operations at the date of acquisition of the debt.

**Nuclear agreement — Pickering units 1 and 2**

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2001 to each of the parties in proportion to their capital contributions. These payments, termed “payback”, represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

**Commissioning energy**

Revenues from the sale of power and energy include revenues from energy produced by generating units during the commissioning period. A charge is included in the cost of operations for the value attributed to the energy produced during the commissioning period. This charge is equivalent to the operating and fuel costs of producing the same quantity of energy at generating units displaced because of the commissioning activity.

**Appropriations from net income**

Under the provisions of the Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to

include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies.

The debt retirement appropriation is the amount required under the Act to accumulate in 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

**Foreign currency translation**

Long-term debt payable in foreign currencies is translated to Canadian currency at rates of exchange at the time of issue. Current monetary assets and liabilities, including long-term debt payable within one year, are translated to Canadian currency at year-end rates of exchange and the resulting gains or losses, together with realized exchange gains or losses, are credited or charged to operations.

**Pension plan**

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. The pension costs, as actuarially determined, include current service costs and amounts required to amortize any surpluses or unfunded liabilities. Pension plan surpluses or unfunded liabilities are amortized over a fifteen year period.

**Research and development**

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility.



**Auditors’ Report**

We have examined the statement of financial position of Ontario Hydro as at December 31, 1981 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1981 and the results of its operations

and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles. Further, in our opinion, such principles, except for the change in accounting for redemption discounts or premiums on debt acquired prior to the date of maturity as described in the summary of significant accounting policies and in note 19 to the financial statements, have been applied on a basis consistent with that of the preceding year.

Toronto, Canada,  
March 8, 1982.

CLARKSON GORDON  
Chartered Accountants



## Statement of Operations for the year ended December 31, 1981

	1981 \$'000	1980 \$'000
<b>Revenues</b>		
Primary power and energy		
Municipal utilities . . . . .	1,800,129	1,800,129
Rural retail customers (note 1) . . . . .	545,760	545,760
Direct industrial customers . . . . .	391,038	391,038
	<u>2,736,927</u>	2,458,473
Secondary power and energy (note 2) . . . . .	424,581	360,742
	<u>3,161,508</u>	2,819,215
<b>Costs</b>		
Operation, maintenance and administration . . . . .	764,712	639,572
Fuel used for electric generation . . . . .	762,571	673,856
Power purchased . . . . .	127,919	127,919
Nuclear agreement — payback . . . . .	62,801	62,801
Commissioning energy . . . . .	2,858	2,858
Depreciation (note 3) . . . . .	324,596	324,596
	<u>2,045,457</u>	1,851,592
<b>Income before financing charges and     extraordinary item . . . . .</b>	<u>1,116,051</u>	1,051,083
Interest (note 4) . . . . .	657,490	655,399
Foreign exchange (note 5) . . . . .	51,743	19,236
	<u>709,233</u>	674,637
<b>Income before extraordinary item . . . . .</b>	406,818	376,426
Extraordinary item (note 6) . . . . .	—	160,000
<b>Net income . . . . .</b>	<u><u>406,818</u></u>	<u>216,426</u>
<b>Appropriation for:</b>		
Debt retirement as required by the Power Corporation Act . . . . .	152,766	152,766
Stabilization of rates and contingencies . . . . .	254,052	78,653
	<u><u>406,818</u></u>	216,426

See accompanying summary of significant  
accounting policies and notes to financial statements.



## Statement of Financial Position as at December 31, 1981



Assets	1981	1980
	\$'000	\$'000
<b>Fixed assets</b>		
Fixed assets in service (note 7) . . . . .	12,489,659	10,887,352
Less accumulated depreciation . . . . .	<u>2,787,400</u>	<u>2,443,317</u>
	9,702,259	8,444,035
Construction in progress (note 7) . . . . .	5,381,265	4,801,293
Deferred construction projects (note 8) . . . . .	<u>364,001</u>	<u>384,849</u>
	<u>15,447,525</u>	<u>13,630,177</u>
<b>Current assets</b>		
Cash and short-term investments (note 9) . . . . .	408,441	239,118
Accounts receivable . . . . .	373,309	346,840
Fuel for electric generation (note 10) . . . . .	681,320	618,262
Materials and supplies, at cost . . . . .	<u>157,421</u>	<u>144,179</u>
	<u>1,620,491</u>	<u>1,348,399</u>
<b>Other assets</b>		
Unamortized advances for fuel supplies (note 11) . . . . .	596,824	414,105
Unamortized debt discount (note 19) . . . . .	72,785	121,829
Long-term accounts receivable and other assets . . . . .	<u>91,996</u>	<u>78,837</u>
	<u>761,605</u>	<u>614,771</u>
	<u>17,829,621</u>	<u>15,593,347</u>

See accompanying summary of significant  
accounting policies and notes to financial statements.



Liabilities	1981	1980
	\$'000	\$'000
Long-term debt		
Bonds and notes payable (note 12) . . . . .	13,840,051	13,375,704
Other long-term debt (note 13) . . . . .	260,300	260,300
	<u>14,100,351</u>	<u>12,375,704</u>
Less payable within one year . . . . .	437,769	370,646
	<u>13,662,582</u>	<u>12,005,058</u>
Current liabilities		
Accounts payable and accrued charges . . . . .	541,778	470,032
Short-term notes payable . . . . .	97,200	144,525
Accrued interest . . . . .	400,639	318,809
Long-term debt payable within one year . . . . .	437,769	370,646
	<u>1,477,386</u>	<u>1,304,012</u>
Contingencies (notes 7, 8 and 14)		
Equity		
Equities accumulated through debt retirement appropriations . . . .	1,803,662	1,803,662
Reserve for stabilization of rates and contingencies . . . . .	759,296	759,296
Contributions from the Province of Ontario as assistance		
for rural construction . . . . .	126,695	126,695
	<u>2,689,653</u>	<u>2,284,277</u>
	<u>17,829,621</u>	<u>15,593,347</u>

On behalf of the Board

Chairman
President

Toronto, Canada  
March 8, 1982



Statement of Equities Accumulated through  
Debt Retirement Appropriations  
for the year ended December 31, 1981

	Municipal Utilities	Power District (Rural Retail and Direct Industrial Customers)	Totals	
			1981	1980
	\$'000	\$'000	\$'000	\$'000
Balances at beginning of year . . . . .	1,158,456	493,481	1,651,937	1,516,026
Debt retirement appropriation . . . . .	103,044	49,722	152,766	137,743
Transfers and refunds on annexations by municipal utilities . . . . .	4,205	(5,246)	(1,041)	(1,832)
Balances at end of year . . . . .	<u>1,265,705</u>	<u>537,957</u>	<u>1,803,662</u>	<u>1,651,937</u>

Statement of Reserve for Stabilization  
of Rates and Contingencies  
for the year ended December 31, 1981

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers			Totals	
		Municipal Utilities	Rural Retail Customers	Direct Industrial Customers	1981	1980
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Balances at beginning of year . . . . .	504,411	1,144	(1,043)	1,133	505,645	426,817
Appropriation . . . . .	257,196	113	(188)	(3,069)	254,052	78,683
Transfers and recoveries on annexations by municipal utilities . . . . .	(144)	—	(144)	—	(288)	255
Payment to Ontario Municipal Electric Association (note 15) . . .	—	(113)	—	—	(113)	(110)
Balances at end of year . . .	<u>761,463</u>	<u>1,144</u>	<u>(1,375)</u>	<u>(1,936)</u>	<u>759,296</u>	<u>505,645</u>

See accompanying summary of significant  
accounting policies and notes to financial statements.



# Statement of Changes in Financial Position for the year ended December 31, 1981

	1981	1980
	\$'000	\$'000
Source of Funds		
Operations		
Income before extraordinary item . . . . .	406,818	376,426
Depreciation, a charge not requiring funds in the current year . . .	324,596	305,967
	731,414	682,393
Financing		
Long-term debt		
Bonds and notes payable and other long-term debt issued . . .	2,246,160	1,462,082
Less retirements . . . . .	521,513	602,110
	1,724,647	859,979
Short-term notes payable — (decrease) increase . . . . .	(47,325)	124,455
Cash and investments — (increase) decrease . . . . .	(169,323)	195,410
	1,507,999	1,179,844
Accounts payable and accrued interest — increase (decrease) . . . .	153,576	(119,555)
Accounts receivable and other assets — decrease (increase) . . . . .	7,974	(78,331)
	2,400,963	1,664,351
Application of Funds		
Net additions to fixed assets (note 16) . . . . .	2,144,210	1,469,550
Unamortized advances for fuel supplies — increase . . . . .	182,719	146,722
Fuel, materials and supplies — increase . . . . .	74,034	48,079
	2,400,963	1,664,351

See accompanying summary of significant accounting policies and notes to financial statements.



## Notes to Financial Statements

### 1. Rural retail revenues

Rural retail revenues for 1981 include \$20 million provided to Ontario Hydro by the Province of Ontario in order to reduce the differential between rural and urban residential electricity rates. These funds enabled Ontario Hydro to provide discounts to rural residential customers during 1981.

### 2. Secondary power and energy

Secondary power and energy is comprised mainly of revenues of \$423 million in 1981 (1980 — \$359 million) from sales of electricity to United States utilities.

### 3. Depreciation

	1981	1980
	\$'000	\$'000
Depreciation of fixed assets in service . . . . .	382,475	334,901
Amortization of deferred construction projects . . . . .	16,323	13,954
Costs of removal less salvage proceeds on retirements . . . . .	4,054	2,573
	<u>402,852</u>	<u>351,428</u>
Less:		
Depreciation charged to — heavy water production . . . . .	50,672	21,605
— construction in progress . . . . .	21,308	17,636
— fuel for electric generation . . . . .	2,266	2,248
Net gains on sales of fixed assets . . . . .	4,010	3,972
	<u>78,256</u>	<u>45,461</u>
	<u>324,596</u>	<u>305,967</u>

Depreciation of fixed assets in service includes \$13 million (1980 — \$4 million) for the amortization of non-operating generating units which have been mothballed for future use. (See note 7.)

### 4. Interest

	1981	1980
	\$'000	\$'000
Interest on bonds, notes, and other debt . . . . .	1,369,933	1,165,921
Less:		
Interest charged to — construction in progress . . . . .	472,596	328,985
— heavy water production . . . . .	96,537	34,343
— unamortized advances for fuel supplies . . . . .	48,366	29,323
— fuel for electric generation . . . . .	10,259	8,603
Interest earned on investments . . . . .	84,685	72,664
Net gain on redemption of debt and sale of investments . . . . .	—	36,604
	<u>712,443</u>	<u>510,522</u>
	<u>657,490</u>	<u>655,399</u>

### 5. Foreign exchange

	1981	1980
	\$'000	\$'000
Exchange loss on redemption and translation of foreign long-term debt . . . . .	40,742	23,470
Net exchange loss (gain) on other foreign transactions . . . . .	11,001	(4,232)
	<u>51,743</u>	<u>19,238</u>

### 6. Extraordinary item

As a result of the 1980 and 1981 forecasts projecting reduced rates of growth in future electrical demand, and the fact that studies indicated it was cost effective to install nuclear and hydraulic generation before adding more fossil-fueled stations, the plan to complete an oil-fueled generating station at Wesleyville was cancelled effective December 31, 1980. This cancellation resulted in an extraordinary charge of \$160 million against income in 1980 to write off the construction project costs and to provide for the estimated costs of cancellation.

7. Fixed assets

	1981			1980		
	Assets in Service	Accumulated Depreciation	Construction in Progress	Assets in Service	Accumulated Depreciation	Construction in Progress
Generation — hydraulic . . .	1,747,545	421,769	8,454	1,733,004	390,861	11,714
— fossil . . . . .	2,579,429	717,339	407,132	2,254,239	635,175	549,632
— nuclear . . . . .	1,902,932	309,839	4,059,144	1,896,320	245,889	2,781,114
Heavy water . . . . .	590,670	77,264	564,022	589,484	66,533	249,134
Transmission and distribution . . . . .	3,680,004	852,513	302,254	3,396,803	783,017	326,307
Administration and service . . . . .	602,988	234,781	40,259	547,038	200,329	24,752
Heavy water production facilities . . . . .	1,386,091	173,895	—	470,464	121,513	858,640
	<u>12,489,659</u>	<u>2,787,400</u>	<u>5,381,265</u>	<u>10,887,352</u>	<u>2,443,317</u>	<u>4,801,293</u>

As a result of forecasts projecting reduced rates of growth in future electrical demand, certain fossil-fueled generating units were mothballed for future use; during 1979 and 1980, five units at the R. L. Hearn Generating Station, and during 1980, two units at Lennox Generating Station were mothballed. The capital cost and accumulated depreciation of these non-operating units, amounting to \$268 million and \$89 million, respectively (1980 — \$268 million and \$76 million, respectively), are included in fossil generation assets in service. At this time it is uncertain when these units will resume operation.

Construction in progress at December 31, 1981 is comprised of:

	Remaining Number of Units Scheduled	Planned In-Service Dates	Dependable Capacity to be Placed in Service	Costs Incurred to December 31, 1981	Estimated Future Costs to Complete (Including Escalation)
			MW	\$ millions	\$ millions
Nuclear generating stations (including heavy water)					
Pickering "B" . . . . .	4	1983-85	2,064	2,138	1,509
Bruce "B" . . . . .	4	1984-87	3,000	1,922	3,618
Darlington . . . . .	4	1988-90	3,524	386	9,141
Fossil generating stations					
Thunder Bay . . . . .	1	1982	149	148	35
Atikokan . . . . .	1	1984	206	182	482
All other construction in progress . . . . .	—	—	—	605	—
				<u>5,381</u>	

The above estimates are the most recent forecasts as of March 8, 1982. These estimates include cost escalation which is forecast to range between 10.5% and 12.7% per year in the period 1982 to 1990. Interest is also added to the cost of construction in progress at rates which average 16.1% per year over this period. Because of long construction lead times on these projects and the uncertainties associated with the economic assumptions, the above planned in-service dates and estimated future costs to complete are subject to change.

8. Deferred construction projects

	1981			1980		
	Capital Cost	Accumulated Amortization	Unamortized Cost	Capital Cost	Accumulated Amortization	Unamortized Cost
Bruce Heavy Water Plant "D" . . . . .	377,515	14,812	362,703	395,840	13,540	382,300
Minor projects . . . . .	4,983	3,685	1,298	5,724	3,175	2,549
	<u>382,498</u>	<u>18,497</u>	<u>364,001</u>	<u>401,564</u>	<u>16,715</u>	<u>384,849</u>

As a result of forecasts projecting reduced rates of growth in future electrical demand, the Board of Directors made revisions to the capital construction program for Bruce Heavy Water Plant "D". In 1978, it was decided to stop construction on the second half of the plant and store the components. In 1979, it was decided to complete construction and then mothball the first half of the plant. At this time it is uncertain when the plant will be used.



## 9. Cash and short-term investments

	1981	1980
	\$'000	\$'000
Cash and interest bearing deposits with banks and trust companies .....	293,059	67,012
Corporate notes .....	76,285	53,580
Government and government-guaranteed securities .....	39,097	118,526
	<u>408,441</u>	<u>239,118</u>

Corporate notes were recorded at cost which approximates market value. Government and government-guaranteed securities were recorded at the lower of cost or market value; market value as at December 31, 1981 was \$39 million (1980 — \$120 million).

## 10. Fuel for electric generation

	1981	1980
	\$'000	\$'000
Inventories — coal .....	488,048	484,511
— uranium .....	154,977	100,608
— oil .....	38,295	33,143
	<u>681,320</u>	<u>618,262</u>

## 11. Unamortized advances for fuel supplies

	1981	1980
	\$'000	\$'000
Coal .....	111,576	99,799
Uranium .....	485,248	314,306
	<u>596,824</u>	<u>414,105</u>

Based on present commitments, additional advance payments for fuel supplies will total approximately \$244 million over the next five years, including approximately \$155 million in 1982.

## 12. Bonds and notes payable

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

1981					1980	
Years of maturity	Principal Outstanding \$'000			Weighted Average Coupon Rate	Principal Outstanding \$'000	Weighted Average Coupon Rate
	Canadian	Foreign	Total		Total	
1981	—	—	—		354,540	
1982	206,434	213,127	419,561		386,156	
1983	171,043	201,906	372,949		375,126	
1984	100,077	114,096	214,173		214,764	
1985	564,965	293,178	858,143		860,801	
1986	—	148,118	148,118		—	
1 — 5 years	1,042,519	970,425	2,012,944	9.0%	2,191,387	8.9%
6 — 10 years	249,862	1,188,943	1,438,805	11.7	770,260	7.5
11 — 15 years	605,709	284,372	890,081	8.3	558,705	8.5
16 — 20 years	2,414,949	542,812	2,957,761	10.7	2,363,264	9.3
21 — 25 years	1,446,162	1,008,449	2,454,611	9.6	2,805,764	9.3
26 — 30 years	1,763,070	2,322,779	4,085,849	10.8	3,413,969	10.0
	<u>7,522,271</u>	<u>6,317,780</u>	<u>13,840,051</u>		<u>12,103,349</u>	
Currency in which payable						
Canadian dollars . . . . .			7,522,271		6,823,253	
United States dollars . . . . .			6,185,064		5,132,709	
West German Deutsche marks . . . . .			75,992		90,663	
Swiss francs . . . . .			56,724		56,724	
			<u>13,840,051</u>		<u>12,103,349</u>	

The bonds and notes payable in United States dollars include \$4,502 million (1980 — \$3,949 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. Except for these bonds and \$1,000 million (1980 — \$500 million) of bonds issued to the Province of Ontario with respect to Canada Pension Plan funds advanced to Ontario Hydro, all bonds and notes payable are guaranteed as to principal and interest by the Province of Ontario.

The long-term bonds and notes payable in foreign currencies are translated into Canadian currency at rates of exchange at time of issue. If translated at year-end rates of exchange, the total amount of these liabilities would have to be increased by \$681 million at December 31, 1981 (1980 — \$794 million).

### 13. Other long-term debt

	1981	1980
	\$'000	\$'000
The balance due to Atomic Energy of Canada Limited for the purchase of Bruce Heavy Water Plant "A". Under the purchase agreement, Ontario Hydro pays equal monthly instalments of blended principal and interest to December 28, 1992, with interest at the rate of 7.795% .....	187,107	197,549
Capitalized lease obligation for the head office building at 700 University Avenue, Toronto. The lease obligation is for the 30-year period ending September 30, 2005, payable in United States dollars at an effective interest rate of 8%. .....	41,889	42,455
Capitalized lease obligations for transport and service equipment. Under these agreements, monthly instalments of blended principal and interest will be paid to 1988, at effective interest rates ranging from 6.8% to 22.75%. .....	31,304	32,351
	<u>260,300</u>	<u>272,355</u>

Payments required on the above debt, excluding interest, will total \$99 million over the next five years. The amount payable within one year is \$18 million (1980 — \$16 million).

### 14. Fuel used for electric generation

Ontario Hydro has contracted with Petrosar Limited for the purchase of 20,000 barrels of residual fuel oil per day through to April 1992. Deliveries in 1981 were 6% (1980 — 18%) of the contract quantities. Ontario Hydro is currently discussing with Petrosar Limited the implications of lower than contracted deliveries. An amount was charged to the 1981 cost of operations to provide for settlement with respect to reduced deliveries in 1980 and 1981.

### 15. Payment to Ontario Municipal Electric Association

The amount of this payment is equivalent to interest on the balance held for the benefit of Municipal Utilities in the Reserve for Stabilization of Rates and Contingencies.

### 16. Net additions to fixed assets

Net additions to fixed assets are capital construction expenditures less the proceeds on sales of fixed assets. In 1981, net additions to fixed assets reflect proceeds on sales amounting to \$8 million (1980 — \$76 million). For 1982, net additions to fixed assets are estimated to be \$3,034 million.

### 17. Pension plan

The most recent actuarial valuation of Ontario Hydro's pension plan as at December 31, 1980 reported a surplus of approximately \$17 million (December 31, 1979 — \$81 million).

The significant actuarial assumptions used in the 1980 valuation (1979 valuation) were:

- rate used to discount future investment income 8.5% (1979 — 7%) and future benefits 8% (1979 — 7%)
- salary escalation rate 8% (1979 — 6.75%)
- average retirement age for males 61.8 (1979 — 62.2) and for females 60.8 (1979 — 61.9)
- common stock valuation 5 year average (1979 — 5 year average)

The effect of the above changes in valuation assumptions, partially offset by the experience surplus for 1980, reduced the pension plan surplus by \$64 million.

The pension plan costs for 1981 were \$60 million (1980 — \$43 million), after a reduction of \$1 million (1980 — \$7 million) for the amortization of pension plan surplus.

### 18. Research and development

In 1981, approximately \$50 million of research and development costs were charged to operations and \$5 million were capitalized (1980 — \$41 million and \$4 million, respectively).

### 19. Change in accounting policy

Effective January 1, 1981, redemption discounts or premiums on debt acquired prior to the date of maturity are being amortized over the period from the acquisition date to the original maturity date of the debt. Prior to January 1, 1981, these redemption discounts or premiums were credited or charged to operations at the acquisition date of the debt. This change has been applied on a prospective basis because of the nature of the environment in which Ontario Hydro establishes its power rates. The effect of this change has been to decrease net income for the year ended December 31, 1981 by approximately \$90 million. This amount has been reflected as a reduction from the unamortized debt discount as shown in the statement of financial position as at December 31, 1981.



## The Pension and Insurance Fund Statement of Assets as at December 31, 1981

	1981 \$'000	1980 \$'000
Fixed income securities		
Government and government-guaranteed bonds . . . . .	174,316	299,974
Corporate bonds . . . . .	283,183	173,055
First mortgages . . . . .	369,000	
Total fixed income securities . . . . .	826,499	848,369
Equities — corporate shares . . . . .	449,051	343,282
Cash and short-term investments . . . . .	142,978	72,283
Total investments . . . . .	1,418,528	1,263,934
Accrued interest and dividends . . . . .	24,384	17,224
Receivable from Ontario Hydro . . . . .	2,630	2,965
	<u>1,445,542</u>	<u>1,284,123</u>

### Notes

#### 1. Accounting Policies

In the above statement of assets which is prepared on the accrual basis of accounting, bonds are included at amortized cost, first mortgages at balance of principal outstanding and shares at cost. Total bonds and shares at December 31, 1981 with a book value of \$907 million had a market value of \$954 million (1980 — \$816 million and \$928 million, respectively).

#### 2. Actuarial Valuation

The most recent actuarial valuation of Ontario Hydro's pension plan at December 31, 1980 reported a surplus of approximately \$17 million (December 31, 1979 — \$81 million). Pension plan surpluses or unfunded liabilities are amortized over a fifteen year period.

### Auditors' Report

We have examined the statement of assets of The Pension and Insurance Fund of Ontario Hydro as at December 31, 1981. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statement presents fairly the assets of the fund as at December 31, 1981 in accordance with the accounting policies described in note 1 applied on a basis consistent with the preceding year.

Toronto, Canada,  
March 8, 1982.

CLARKSON GORDON  
Chartered Accountants

## Five Year Summary of Financial Statistics

	1977	1978	1979	1980	1981
	<i>(in thousands of dollars)</i>				
<b>Revenues</b>					
Primary power and energy					
Municipal utilities . . . . .	1,108,099	1,275,107	1,441,557	1,603,072	1,800,129
Rural retail customers . . . . .	407,382	442,224	474,795	513,616	545,760
Direct industrial customers . . . . .	243,560	261,816	305,210	341,785	391,038
	<u>1,759,041</u>	<u>1,979,147</u>	<u>2,221,562</u>	<u>2,458,473</u>	<u>2,736,927</u>
Secondary power and energy . . . . .	210,046	288,533	346,558	360,742	424,581
	<u>1,969,087</u>	<u>2,267,680</u>	<u>2,568,120</u>	<u>2,819,215</u>	<u>3,161,508</u>
Less excess revenues <sup>(1)</sup> . . . . .	122,093	130,292	—	—	—
	<u>1,846,994</u>	<u>2,137,388</u>	<u>2,568,120</u>	<u>2,819,215</u>	<u>3,161,508</u>
<b>Operating costs</b>					
Operation, maintenance and					
administration . . . . .	414,307	501,800	601,422	639,572	764,712
Fuel used for electric generation . . . . .	441,902	487,037	605,839	673,856	762,571
Depreciation . . . . .	215,601	265,060	284,610	305,967	324,596
Other . . . . .	177,807	166,751	154,427	148,757	193,578
	<u>1,249,617</u>	<u>1,420,648</u>	<u>1,646,298</u>	<u>1,768,152</u>	<u>2,045,457</u>
<b>Income before financing charges</b>					
<b>and extraordinary item . . . . .</b>	<u>597,377</u>	<u>716,740</u>	<u>921,822</u>	<u>1,051,063</u>	<u>1,116,051</u>
<b>Financing charges</b>					
Interest on bonds, notes and other					
debt . . . . .	753,251	899,817	1,029,568	1,165,921	1,369,933
Capitalized interest . . . . .	(283,624)	(304,119)	(341,073)	(401,254)	(627,758)
Investment income . . . . .	(62,075)	(76,249)	(105,163)	(109,268)	(84,685)
	<u>407,552</u>	<u>519,449</u>	<u>583,332</u>	<u>655,399</u>	<u>657,490</u>
Foreign exchange (gain) loss . . . . .	(3,724)	29,346	70,875	19,238	51,743
	<u>403,828</u>	<u>548,795</u>	<u>654,207</u>	<u>674,637</u>	<u>709,233</u>
<b>Income before extraordinary item . . . .</b>	<u>193,549</u>	<u>167,945</u>	<u>267,615</u>	<u>376,426</u>	<u>406,818</u>
Extraordinary item . . . . .	—	20,500	—	160,000	—
<b>Net income . . . . .</b>	<u>193,549</u>	<u>147,445</u>	<u>267,615</u>	<u>216,426</u>	<u>406,818</u>

See footnotes on page 39.



	1977	1978	1979	1980	1981
	<i>(in mills per kilowatt-hour of total energy delivered)</i>				
<b>Average revenue per kilowatt-hour<sup>(2)(7)</sup></b>					
Primary power and energy					
Municipal utilities . . . . .	18.99	20.81	22.76	24.70	27.10
Rural retail customers . . . . .	31.28	34.21	36.49	39.70	42.82
Direct industrial customers . . . . .	16.04	17.72	19.37	20.80	22.90
Secondary power and energy . . . . .	24.63	27.76	29.72	33.63	38.38
All classifications combined . . . . .	20.71	22.82	24.75	26.85	29.46
	<i>(expressed as a %)</i>				
<b>Average rate increases<sup>(1)</sup></b>					
Municipal utilities . . . . .	30.3	9.4	9.8	8.6	9.3
Rural retail customers . . . . .	25.6	9.8	7.0	6.2	11.2
Direct industrial customers . . . . .	32.3	10.3	10.1	7.1	9.6
	<i>(in mills per kilowatt-hour of energy generated)</i>				
<b>Average cost per kilowatt-hour<sup>(3)(7)</sup></b>					
Hydraulic					
Operation, maintenance and administration . . . . .	.78	.86	.98	1.09	1.49
Fuel — water rentals . . . . .	.44	.48	.52	.58	.66
Depreciation and financing charges . . . . .	3.25	3.39	3.26	3.24	3.51
	<u>4.47</u>	<u>4.73</u>	<u>4.76</u>	<u>4.91</u>	<u>5.66</u>
Nuclear					
Operation, maintenance and administration . . . . .	2.91	3.12	3.32	3.49	4.11
Fuel — uranium . . . . .	1.29	1.61	1.94	2.39	2.32
Depreciation and financing charges . . . . .	6.54	8.69	9.26	7.65	8.06
	<u>10.74</u>	<u>13.42</u>	<u>14.52</u>	<u>13.53</u>	<u>14.49</u>
Fossil					
Operation, maintenance and administration . . . . .	2.49	2.98	3.27	3.42	3.76
Fuel — coal, gas and oil . . . . .	13.17	15.42	17.08	18.56	21.05
Depreciation and financing charges . . . . .	5.18	6.90	7.15	6.46	6.14
	<u>20.84</u>	<u>25.30</u>	<u>27.50</u>	<u>28.44</u>	<u>30.95</u>

See footnotes on page 39.

	1977	1978	1979	1980	1981
	<i>(in thousands of dollars)</i>				
<b>Financial position</b>					
Total assets .....	11,385,635	13,162,506	14,513,729	15,593,347	17,829,621
Fixed assets .....	9,953,978	11,340,961	12,628,842	13,630,177	15,447,525
Long-term debt .....	8,695,853	10,226,763	11,134,185	12,005,058	13,662,582
Equity .....	1,656,763	1,802,793	2,069,538	2,284,277	2,689,653
<b>Major sources of funds</b>					
Operations .....	409,150	433,005	552,225	682,393	731,414
Bonds and notes payable and other long-term debt — net increase .....	1,130,065	1,489,912	1,117,050	859,979	1,724,647
<b>Major application of funds</b>					
Net additions to fixed assets .....	1,413,120	1,652,043	1,574,716	1,469,550	2,144,210
Unamortized advances for fuel supplies — net increase .....	57,169	45,626	126,680	146,722	182,719
<b>Financial indicators</b>					
Interest coverage <sup>(4)</sup> .....	1.26	1.19	1.26	1.32	1.30
Debt ratio <sup>(5)</sup> .....	.844	.853	.848	.846	.841
Return on average rate base (%) <sup>(6)</sup> .....	9.3	9.4	10.1	10.8	11.3

**Footnotes**

- (1) Ontario Hydro was required by the Province of Ontario to conform with the spirit and intent of the Federal Anti-Inflation program as it applied to net income for the years 1977 and 1978. Excess revenues were applied to reduce customers' bills in 1978, 1979 and 1980.
- (2) Figures for 1977 and 1978 are before deduction of excess revenues. (See footnote 1.)
- (3) Average cost per kilowatt-hour represents the costs attributable to generation but excludes the costs related to transmission, distribution and corporate administrative activities. These figures reflect the historical accounting costs of operating facilities and the actual energy generated by these facilities during the year.
- (4) Interest coverage represents income before extraordinary item plus gross interest (interest on bonds and notes payable, short-term notes payable and other long-term debt) divided by gross interest.
- (5) Debt ratio represents debt (bonds and notes payable, short-term notes payable and other long-term debt) divided by debt plus equity.
- (6) Return on average rate base represents income before extraordinary item plus gross interest (interest on bonds, notes and other debt) divided by average rate base (total assets less accounts payable and accrued charges, accrued interest, and contributions from the Province of Ontario as assistance for rural construction).
- (7) Figures for 1981 are preliminary.



## COMPARATIVE STATISTICS

	1981	1980	1979	1976	1971
<b>Operating</b>					
Dependable peak capacity ('000 kW) . . . . .	24,595*	24,457*	24,429*	19,677	13,941
December primary peak demand ('000 kW) . . . . .	16,600	16,808	16,365	15,896	11,534
Primary energy made available ('000,000 kW•h) . . .	101,659	100,174	98,127	90,853	68,134
<b>Customer</b>					
Primary energy sales ('000,000 kW•h)					
Municipal utilities . . . . .	66,421**	64,899	63,349	57,635	41,771
Rural retail . . . . .	12,745**	12,936	13,011	12,436	8,247
Direct industrial . . . . .	17,077**	16,432	15,757	14,071	13,727
<b>Total</b> . . . . .	<b>96,243**</b>	<b>94,267</b>	<b>92,117</b>	<b>84,142</b>	<b>63,745</b>
Secondary energy sales ('000,000 kW•h) . . . . .	11,063**	10,727	11,662	4,157	4,087
Total Ontario customers ('000)					
Residential . . . . .	2,540**	2,493	2,449	2,297	2,052
Farm . . . . .	110**	112	113	121	126
Commercial and industrial . . . . .	328**	322	316	292	256
<b>Total</b> . . . . .	<b>2,978**</b>	<b>2,927</b>	<b>2,878</b>	<b>2,710</b>	<b>2,434</b>
Average annual kW•h per customer					
Residential . . . . .	9,860**	9,821	9,839	9,708	8,063
Farm . . . . .	20,978**	19,978	19,225	16,955	13,021
Commercial and industrial . . . . .	202,900**	202,582	204,113	198,722	175,636
Average revenue per kW•h (¢)					
Residential . . . . .	3.96**	3.60	3.22	2.23	1.45
Farm . . . . .	4.18**	3.74	3.42	2.46	1.79
Commercial and industrial . . . . .	2.88**	2.66	2.35	1.63	1.00
Staff, average for year . . . . .	30,850	28,902	28,385	24,123	23,264

\*Includes mothballed generation; 1981 — 1,913,000 kW; 1980 — 1,704,000 kW; 1979 — 550,000 kW.

\*\*Preliminary

BOARD OF DIRECTORS

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- A/F/M/S/T **Arthur J. Bowker**, Ottawa  
Vice-Chairman, Ontario Hydro  
Chairman, Technical Advisory Committee  
Research Officer  
National Research Council
- A/S **Alan B. Cousins**, Wallaceburg  
President, Ideal Stampings Limited
- A/F/T **A. Ephraim Diamond**, Toronto  
Chairman, Audit Committee  
President  
Whitecastle Investments Limited
- A/S **Albert G. Hearn**, Agincourt  
Former Vice-President  
Service Employees International Union
- S **J. Conrad Lavigne**, Timmins  
President, Mid Canada Television System
- F/S **Philip B. Lind**, Toronto  
Chairman, Social Responsibility Committee  
Senior Vice-President  
Rogers Cablesystems Limited
- A/F/M/S/T **Hugh L. Macaulay**, Toronto  
Chairman, Ontario Hydro  
Chairman, Finance Committee  
Chairman, Management Resources Committee
- A/S **Sister Mary**, Toronto  
Executive Director  
St. Michael's Hospital
- F/T **Milan Nastich**, Toronto  
President, Ontario Hydro
- M/T **O. John C. Runnalls**, Toronto  
Professor, Energy Studies  
University of Toronto
- M/T **Leonard N. Savoie**, Sault Ste. Marie  
President and Chief Executive Officer  
Algoma Central Railway
- M/S **William A. Stewart**, London  
Former Ontario Minister of Agriculture and Food
- A Member of the Audit Committee  
F Member of the Finance Committee  
M Member of the Management Resources Committee  
S Member of the Social Responsibility Committee  
T Member of the Technical Advisory Committee  
(As of December 31, 1981)

OFFICERS

- Chairman of the Board**  
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- Vice-Chairman**  
Arthur J. Bowker
- President**  
Milan Nastich
- Executive Vice-Presidents**  
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Executive Vice-President  
Operations  
Arvo Niitenberg  
Executive Vice-President  
Planning & Administration
- Vice-Presidents**  
E. H. (Ted) Burdette  
Vice-President  
Finance  
L. A. (Vern) Coles  
Vice-President  
Distribution & Marketing  
Frank W. Gomer  
Vice-President  
Human Resources  
Sam G. Horton  
Vice-President  
Supply & Services  
H. Allen Jackson  
Vice-President  
Design & Construction  
John G. Matthew  
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Power System Program  
Dane B. MacCarthy  
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Corporate Relations  
Lorne G. McConnell  
Vice-President  
Production & Transmission  
Harold A. Smith, M.B.E., F.R.S.C.  
Vice-President  
Special Assignments  
(Retired May 1, 1981)
- Secretary and General Counsel**  
William E. Raney, Q.C.
- Treasurer**  
Dirk Peper
- Corporate Comptroller**  
Ron W. Bartholomew

REGIONAL DIRECTORS

- Central Region**  
H. K. Wright  
5760 Yonge Street  
Willowdale M2M 3T7
- Eastern Region**  
P. J. Garlough  
420 Dundas St. East  
Belleville K8N 5C3
- Georgian Bay Region**  
F. A. Perttula  
93 Bell Farm Road  
Barrie L4M 1H1
- Niagara Region**  
J. W. H. Kerr  
Box 157, 1053 Main St. West  
Hamilton L8N 3B9
- Northeastern Region**  
C. G. Sanford  
590 Graham Drive  
North Bay P1B 8L4
- Northwestern Region**  
J. D. Hamer  
34 Cumberland St. North  
Thunder Bay P7A 4L5
- Western Region**  
E. G. Bainbridge  
1075 Wellington Road  
London N6E 1M1  
(Dr. D. A. Drinkwalter,  
Deputy Director)



## THE CORPORATION

ONTARIO HYDRO is a special statutory corporation established by the provincial Legislature in 1906 with broad powers to generate, supply and deliver electric power throughout the province.

The Corporation's primary responsibility is to provide power to municipalities — over which it has certain regulatory functions — which in turn distribute the power to customers in their areas. Hydro also supplies more than 100 direct industrial customers and about 760,000 retail customers in rural areas not served by municipal utilities.

In 1981 Hydro's mandate was broadened slightly by two amending acts of the Ontario Legislature. One amendment requires Hydro each year to forecast, for the following year, the differential between rural residential billings and municipal utility residential billings and to discount rural residential rates, if necessary, to reduce the forecast differential to 15 per cent.

The second amending act authorizes Hydro to provide an energy conservation program encouraging the safe and efficient use and conservation of all forms of energy. The act also authorized the Corporation to produce, sell, supply and deliver steam and hot water as primary products from new or existing facilities.

Hydro is part of a massive electric grid providing interconnections with Manitoba Hydro on the west, Hydro-Quebec on the east, and with utilities in New York and Michigan states to the south.

Hydro is governed by the Power Corporation Act, Revised Statutes of Ontario, 1980, c. 384 as amended, which sets out that electrical power and electrical energy be provided to municipal customers at cost. This includes charges for operation, maintenance, administration, depreciation, fixed charges and reserve adjustment. Also included is the cost of the energy conservation program and any difference in revenue resulting from the rural rate differential adjustment. Fixed charges include interest and expenses of debt service and the provisions for the retirement of debt over a 40-year period.

The Province of Ontario guarantees the payment of the principal and interest on bonds and notes issued to the public by Ontario Hydro. In the case of public borrowing in the United States, the Province borrows on behalf of Hydro by issuing its own debentures and advancing the proceeds to Ontario Hydro upon terms and conditions agreed upon between the Corporation and the Treasurer of Ontario.

Ontario Hydro is administered by a Board of Directors consisting of a chairman, a vice-chairman, a president and not more than 10 other directors. Regular review of strategy, programs and resources is a function of the Executive Office, composed of the chairman, the president, the two executive vice-presidents and the secretary and general counsel.





